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The Development of Phonological Assessment Battery (PhAB) in Malay: Validity, Reliability and Standardisation

Paper One: The development of Phonological Assessment Battery (PhAB) in Malay

Paper Two: The test of validity and reliability of the modified PhAB and the standardisation to Brunei-Malay children

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: ……..

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Abbreviations and Definitions

L1	Brunei Malay Language & Standard Malay
LAMP	Literacy and Monitoring Programme
MPhAB	Modified Phonological Assessment Battery
PA	Phonological Awareness
PhAB	Phonological Assessment Battery
SPN21	The National Education System for 21st Century
TEP	Trainee Educational Psychologist
EP	Educational Psychologist
TIARA	The Integrated Approach to Reading Acquisition

Abstract

Many studies in the literature have shown the importance of phonological skills in the development of literacy, particularly in reading. The literacy difficulties evident in both languages; Standard Malay and English, is a concern in schools which requires systematic and appropriate assessment to identify children with poor phonological skills. In this study, the Phonological Assessment Battery (PhAB) was analysed to determine the extent it can be used with Malay speakers. It was developed, validated and tested for its reliability for the purpose of assessing phonological awareness. The modification of PhAB consisted of seven subtests translated to standard Malay (L2): Alliteration, Naming Speed, Rhyme, Spoonerisms, Fluency, Non-word Reading and Supplementary Alliteration. The three types of validity used in this study found that the modified PhAB is a valid tool to measure phonological awareness. The test-retest reliability showed that the modified PhAB is a useful tool for teachers and psychologists in Brunei and other countries where Malay is spoken. The MPhAB provides a basis for future intervention to improve reading difficulties amongst Bruneian children.

Paper One:

The Development of Phonological Assessment Battery (PhAB) in Malay

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1 Introduction

1.1 Purpose

The links between phonological awareness (PA) and acquisition of literacy have been well researched in the literature (Bradley & Bryant, 1983; 1985; Goswami & Bryant, 1990; Mann, 1991). Research indicates that persistent phonological awareness difficulties in children are an important indicator of a specific-reading difficulty.

The research focuses on Bruneian children's phonological skills in Malay. The aim of this research is to develop a phonological assessment for Bruneian school children. The Bruneian educational context is unique due to its multilingual influences. Most Bruneians Malay speak the native Bahasa Brunei at homes. However, they are exposed to education which uses language for instructions foreign to them such as English language and Bahasa Melayu (i.e. the standard Malay). Thus, careful and critical consideration of the appropriateness of using standard Malay as the language for assessment.

1.2 Rationale

The significance of this research is that it addresses a gap in the literature about the assessment of phonological awareness for a bilingual or multilingual population.

To date, there is no intensive assessment developed to measure children's phonological awareness in Brunei. The modification of PhAB (Phonological Awareness Battery) to Malay was attempted by an EP (expatriate) working in Brunei. However, it was found that the items used were not common and/or high frequency words in Malay. There was no standardised and translated Malay instructions

available for all subtest which will be explained further under *Instrument Development* section.

As reviewed by Bernhardt (2005). There are concerns that researchers into second language reading have limited knowledge about the language which they are studying. The researcher's competency issue was not a setback in this study because it is the researcher's first language that would be used to develop assessment of phonological awareness and testing it on the Malay children. Thus, showing an advantage.

As a trainee educational psychologist (TEP) in Brunei and reports from other Educational psychologists (EP), there are some difficulties encountered in choosing assessments suitable for Bruneian Malay children. This is due to lack of assessments with Malay instructions. Most of the time, instructions were translated to accommodate this difficulty.

PhAB was introduced by Frederickson, Frith & Reason (1997) and was deemed a successful and effective assessment tool by (Gomez & Reason, 2002; Hurry & Doctor, 2007). Despite its effectiveness, a limitation of PhAB is that it is not applicable to the Bruneian population. This is due to the first language of most Bruneians which is Malay. If the PhAB original version are used to the Bruneians, most likely, the test is not testing the children's phonological awareness but a test on their English language competencies.

This research challenges the notion that the bilingual children's phonological skills can be assessed via the same English tests that are used for monolingual children. Therefore, there is a need to develop a PhAB suitable for Bruneian Malay children in order to provide information about the difficulties involved in bilingual literacy. The

findings can be used to help schools to identify the children with literacy difficulties and aid EPs to make more informed decisions on the approach schools take in implementing the literacy programme.

1.3 Context

1.3.1 Policy

The need to develop assessments for literacy is evident on a national and international level. On an international level, UNESCO, through its Literacy and Monitoring Programme (LAMP), calls for the development of adult literacy measures which are culturally relevant (Wagner, 2005). Although the focus is on adults' literacy, children too will benefit. Literate parents promote the literacy development of their own children and the literate adults contribute to the children's community, thus having a cyclic effect. This demonstrates the importance of literacy assessment which takes into account cultural knowledge and first language use (UNESCO, 2005).

As this research takes place in Brunei, it is important to discuss the need to develop assessments for literacy on a national level. This is to comply with the goals of the UNESCO Education for All movement which the government of Brunei is a signatory member.

The Compulsory Education Order was authorised by the Bruneian Government in November 2007 in efforts to improve the rate of literacy in Brunei. Under this order, it is compulsory for children from 6-15 years old to attend formal education regularly at a private or government school.

As a vehicle to promote literacy, a bilingual education policy was adopted in Brunei called "Dwibahasa", meaning two languages. This was introduced in 1984 to ensure

that students attain a high degree of proficiency in both English and Malay (Jones, 2009).

Recently, a new education system called SPN21 was implemented nationwide. Its name is the Malay abbreviation for the National Education System in the 21st Century and it was implemented nationwide in 2009. The education system was introduced with an effort to sustain and strengthen the Bruneian students' academic performance in Malay, English, Mathematics and Science.

The introduction of SPN21 was derived from the National Study of Student Competencies commissioned by the Ministry of Education (Ministry of Education, 2007) which stated that 76% of students in Year 4 and 44% of Year 6 have not learned the basic literacy skills in English. A few studies have suggested that Bruneian children also have high rates of literacy difficulty in Malay. (Liew, 1997; Mohd Azurin, 2008; Tamam Timbang, Mahamod, & Hamat, 2010)

Part of the SPN21 is the literacy programme called 'The Integrated Approach to Reading Acquisition' (TIARA). As stated in the TIARA handbook (Ministry of Education, 2010), there is a need for a reading assessment tool to measure the effectiveness of this programme. Moreover, through the teaching of TIARA, it has become apparent that there is a need for phonological awareness tests in Brunei.

Before SPN21 was introduced nationwide, reading was taught only using the look-and-say method. When TIARA programme was implemented, the strategy used to teach literacy in both English and Malay promotes the use of phonics. Through phonics, the children were able to learn the sounds of language where they were taught to be able to hear and distinguish sounds. When children learnt the skills on the awareness of words, rhymes, syllables, onset and rime and phonemes, this

suggests that a phonological awareness assessment needed to be developed to monitor their progress.

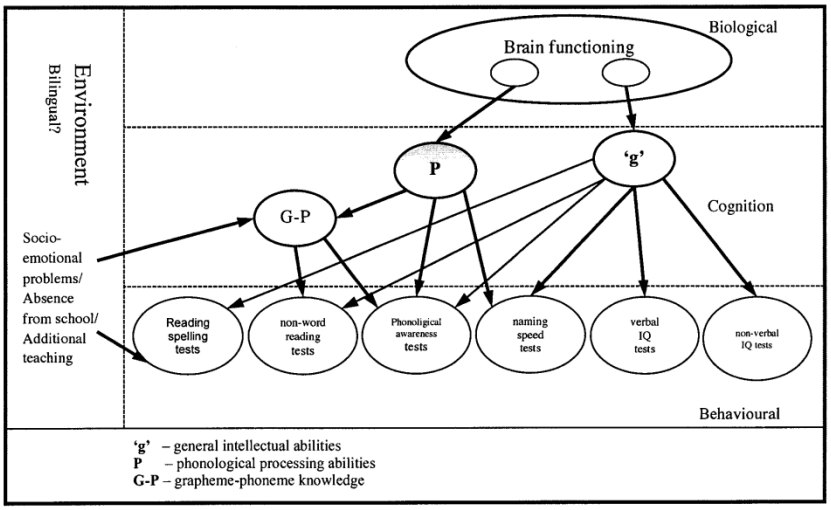
1.3.2 Personal

I am in a very unique position as a TEP, where my trainee practice was carried out both in the UK and Brunei. My research was carried out in Brunei as a condition of my student scholarship from the Bruneian Government. As a Bruneian national I am invested in this research as a way of benefiting the schools and the Educational Psychology Service in Brunei. My interest in phonological awareness initially stems from EP reports stating difficulties in choosing suitable assessments for Bruneian-Malay children. These difficulties were due to the lack of Malay instructed assessments.

In addition, my experience working as a TEP in the UK with children with literacy difficulties has made me aware of the need for research in the area of phonological awareness particularly in Brunei. The presence of assessment on phonological awareness in the children's first language is crucial to inform suitable intervention for those children.

1.3.3 Theoretical

The need to develop an assessment suitable for Brunei context is explained using Frith's theoretical framework (Frith, 1995). The framework also formed the conceptual basis in the development of PhAB which describes the underlying phonological processing difficulties using the three levels of explanation; the biological, cognitive and behavioural shown in Figure 1.1 below.



Types of tests selected to tap components of phonological processing skill

Figure 1. Frith's Theoretical Framework (1995)

The framework describes the importance of environmental factors influencing the phonological processing skills (denoted as 'P' in diagram) at all the three levels. The framework provides a systematic way to suggest that the deficit in phonological processing is directly linked with the poor grapheme-phoneme representation (G-P). This implies that orthography (G-P representation) and environment has an impact on the phonological processing skills at which, in Brunei context, it is the bilingual environment and the orthographies involved are Malay and English.

There are many studies in the literature which supports the effect of various non-English languages and writing systems (particularly, orthography) on the phonological awareness (Goswami, 2000; Perfetti C.A. & Liu, 2005). There are also studies which suggests the impact of language and writing systems on phonological processing skills and in particular, suggesting that phonological development are shaped by native language, orthography and reading instructions (Duncan, Seymour et al, 2000; Duncan, 2010; Goswami, 2010).

These studies offer a strong conclusion that can be made to highlight bilingualism as an environmental influence, impacting on the phonological processing skills.

Hence, suggesting the needs of phonological assessment to evaluate a child's phonological processing skills by considering the orthography the child is exposed to and ones bilingual environment.

1.3.4 Practical / Professional

The provision of resources in Malay has been a challenge to the Educational Psychology Service in Brunei. Traditionally, the Educational Psychologists working in Brunei had to resort to using assessments in English, translating the English test into Malay or devising their own assessment. This also implies that the pre-determined instructions were not given in the same way to all of the participants and that the data and the data collection method are erroneous. Moreover, the procedures do not meet the current legal and professional standards.

Thus, the development of the Modified PhAB, culturally valid for Brunei Malay children is considered as a major breakthrough for the Educational Psychology Service. The success of its development will promote more assessments to be developed which meets the requirement of the professional practice as a test developer. Moreover, the development of MPhAB can be used to promote excellence in education within the Malay speaking areas in the Brunei and other countries such as Malaysia, Singapore.

In the selection of resources for children with additional support needs such as reading difficulties, dyslexia, the lack of information about the child's needs has raised concerns on the teachers. With the development of MPhAB, the child with phonological deficits is diagnosed at an early age and research based intervention is implemented that can prevent reading deficits. This also encourages the development of new teaching strategies that suits bilingual children in Brunei.

Moreover, in the attempt to make the modified PhAB easy to use and administered, more teachers are motivated to use it.

2 Instrument Development

2.1 The Historical Background of PhAB in Malay

Between the year 2000 to 2006, an attempt to modified PhAB was done by an Australian Educational Psychologist working for Educational Psychology Service in Brunei and the modification was at its preliminary stage.

There were spelling mistakes observed, for e.g. kursi – for kerusi, as well as the absence of commonly used words in Malay such as the use of words that starts and/or ends with ‘kh’, ‘ny’ and ‘ng’. Moreover, the Non-word and the Supplementary Alliteration tests were not translated and the standardised instructions were not made available to the users.

Moreover, the translated items were not tested for its reliability and validity and the phonological awareness norm for Bruneian children was not available.

A more detailed description of the attempted modification made by the previous educational psychologist is available in Appendix 1.

Generally, it was found out that the translation of instructions and the choice of some items were not suitable for the Malay children in Brunei. The test lacks of cultural validity. Due to that reasons, a more comprehensive and revised modification needed to be addressed to narrow the gaps identified in the preliminary version. This will ensure the accuracy and suitability of the translation and the test items. Thus, making PhAB more meaningful and culturally valid for the Bruneians.

2.2 The Development and Modification of the PhAB in Malay

The focus of this modification is to create a test which is equivalent to the original PhAB with the same difficulty level, same tasks, same instructions, same testing objective but different language of instructions and, for some subtests, different items with the main focus of making it relevant to the Bruneian context. It is also an attempt to make PhAB a more user-friendly assessment, thus, modifications were made to the manual and the record forms. The layout was also modified to accommodate this.

Prior to its modification, an approval was requested via email from the author of the original PhAB, Norah Frederickson (Appendix 2). There were modifications made on the following sub-tests in the original PhAB. The tests are Alliteration Test, Supplementary Alliteration Test, Naming Speed Test, Rhyme Test, Spoonerisms Test, Fluency Test and Non-word Test.

As described in the PhAB manual, PhAB comprises six standardised tests, all designed to sample different aspects of phonological processing:

- **The Alliteration Test** – assesses a child's ability to isolate the initial sounds in single syllable words.
- **The Naming Speed Tests** – assesses a child's speed of phonological production. These tests include the Picture Naming Test and the Digit Naming Test.
- **The Rhyme Test** – assesses a child's ability to identify the rhyme in single syllable words.
- **The Spoonerisms Test** – assesses whether a child can segment single syllable words and then synthesize the segments to provide new words or word combinations.

- **The Fluency Tests** – assesses a child's retrieval of phonological information from long-term memory.
- **The Non-Word Reading Test** – assesses a child's ability to decode letter strings.

Further description of each test is available in Appendix 3 (Source: PhAB manual, Page 1-2)

The purpose of modification is to make the modified version culturally valid for the Bruneians which uses the commonly used, orthographically legitimate words in Malay. Moreover, modification involves a revision of the preliminary version addressed in Appendix 1 and to address the gaps in the modified version in the study.

In the development of MPhAB, there were 4 important modifications made to the original PhAB. To ease understanding, the modifications made on the subtests are classified in terms of Instructions, Items, Layout: Record Forms and Manual. For each classification, the modification made for each subtest and the rationale behind its modification will be presented below.

2.2.1 Instructions

The instructions for **ALL** the subtests were translated into formal Malay using the commonly used syntax for oral speech. The sequence of instructions followed the sequence used in the PhAB. Important measures were taken to ensure that the translation did not change the meaning from its original.

The modification strategy is implemented for all the subtests without any exceptions.

An example of the translation made to the **Fluency Test**: Semantic:

[Refer to Page 32, Frederickson and Frith et al (1997)]

The English version:

Now tell me lots of things to be eaten, as fast as you can, Ready to tell me lots of things to eat. Starting…now.

The Modified version in Malay:

Sekarang kamu hendaklah memberikan sebanyak yang boleh kamu fikirkan nama makanan dengan secepat mungkin. Bersedia untuk menamakan nama nama makanan yang boleh kita makan, mulai … sekarang.

Items

ALL subtests are translated and modified except for the items is the Naming Speed Test. (Which will be discussed in the next section)

2.2.2 Items

All the items are not the direct translation of the original version. This is due to the nature of test to find the similar sounding words (at the beginning of the words – in Alliteration and the ending of the words – in Rhyme)

If direct translation from English to Malay were applied, the tasks to find the similar sounding words would be impossible.

For example, in the **Alliteration test**:

Refer Page 8, Frederickson, Frith et al (1997)

1) **Ship Fat Fox**

The beginning words are /ʃ/, /f/ and /f/. The test requires the child to choose the words with the same sound. Thus, the correct answer is **fat** and **fox**.

The direct translation of these words into Malay is as follows:

English		**Malay translation**
Ship	–	*Kapal*
Fat	–	*Gemuk*
Fox	–	*Musang*

1)	**Kapal**	**gemuk**	**musang**
	/kapal/	/gəmʊk/	**/**musɑŋ/

The beginning words are /k/, /g/ and /m/. If the direct translation were used for the words *kapal, gemuk, musang*, neither of the three options starts with the similar sound. Thus, the isolation of sounds in not possible. This suggests that it is not realistic to do the direct translation but develop new items in Malay.

This also applies for the Supplementary Alliteration and Rhyme Tests.

Since the direct translation is not feasible, common and high frequency Malay words were surveyed for the modified version. The absence of commonly used Malay words in the preliminary modified PhAB such as words that starts with /kh/, /ny/ and /ng/ was addressed and introduced in the modified version.

In **Alliteration test,** the Malay words used are:

Syukur	**pr**ogram /	**kh**idmat	/ **nya**nyi
Syurga	**pr**omosi	/ **kh**as /	**nya**ris
Syarikat	**pr**oaktif		
Syarat	**pr**osedur		

In **Rhyme test,** the Malay words used are:

Pera**ng**	pera**ngai**	tolo**ng**
Ara**ng**	su**ngai**	koso**ng**

The beginning and ending of the words which is bold fonts suggests that the words begins and/or ends with /ʃ/, /pr/, /kh/, /ngai/ and /ng/ are the most common phoneme of Malay.

The **Supplementary Alliteration test** is similar to the alliteration test but it was presented in pictorial form which requires the child to choose the pictures with the same beginning sound. The internet-searching engine was used to find the most suitable pictures according to the commonly used words in Malay. It was ensured that the pictures are culturally valid for Bruneians and the pictures are suitable for printing in black and white that was used in PhAB.

In **Non-word reading test**, orthographically legitimate non-word or plausible Malay were used such as:

Pran	**Sh**endom	**Kh**idrot
Khom	Kul**nya**	
Mus**nga**	**Sy**aki**ng**	

<u>Modification of words in the Non-word Reading Test</u>

For items No. 1-9, 11, 12, 15 and 20, **NO** modifications needed in the original due to the existing orthographically legitimate Malay words.

(**Acceptable equivalence of Malay words/ pronunciations)**

1. Pim (i as in pin; rhymes with *krim*)
2. Gat (a as in *lalat*)
3. Fot (o as in *bot*)
4. Lub (u as in *tutup*)
5. Hin (i as in *dinar*)
6. Chog (o as in *bot*)
7. Trum (u as in *tutup*; rhymes with *belum*)
8. Pran (a as in *lalat*; rhymes with *bulan*)
9. Nabe (a as in *lalat*)
11. Haplut (a as in *lalat*; u as in *tutup*; lut rhymes with *lulut*)
12. Yutmip (u as in *tutup*; i as in *dinar*)
15. Shendom (e as in *gemuk* or *gendong*; o as in bot; shen rhymes with *pen*, dom rhymes with *pom* or *minum*)
20. Plutskirl (u as in *minum*; i as in *sikut*; plut rhymes with *lulut*, skirl rhymes with *akhir*)

However, items No.13, 14, 16-19 were modified to accommodate the common, orthographically legitimate words in Malay such as the use of the double consonants

blend words ***kh, ng, ny, sy*** and ***sh*****.** Modification was made to accommodate these words and not necessarily due to being unacceptable.

However, Items no. 10, 14 and 18; Leaze, Pootfeg and Ropsatch respectively were modified and the rationales for their modification are explained below.

10. Leaze** was replaced with **Kh**om.
- The diphthong 'ea' and words that contain letter 'z' is not common in Malay, this word was replaced with a more commonly used word.
- Kh as in *khas*; o as in *pom*

13. Musnate was replaced with Mus**ng**a (u as in *lulus*; ng rhymes with *bunga*)
14. Pootfeg was replaced with P**o**tfeg.
- This is due to the absence of words with double vowels in Malay. Thus, the **oo** is replaced with single **o.**
- O as in *bot*

16. Ligtade was replaced with Kul**ny**a (u as in *lulus*; ny as in *bunyi*)
17. Cromgat was replaced with **Sy**aki**ng** (sy as in syarikat; ng rhymes with *pasang*)
18. Ropsatch was replaced with Rop**sat**
- This is due to the absence of triple consonant blend word endings such as **tch** in Malay.
- O as in *pokok*; a as in *lalat*)

19. Rissbick was replaced with **Kh**idrot (kh as in khidmat, o as in *pom*)

The **Naming Speed Test** consists of two parts i.e. the Picture Naming and the Digit Familiarization. This requires the child to name the pictures as fast possible and the duration to name the series of random pictures are noted.

In the Picture Naming Test, a series of random pictures of hats, doors, balls, tables are presented randomly. The procedure is very similar to Digit Familiarisation Test whereby a series of numbers are randomly presented where the child has to read the numbers, across the row, as fast as possible and the time taken to read the numbers are noted.

The pictures and digits were not modified due to culturally valid pictures of hats, doors, balls, tables and digits used.

2.2.3 Layout: Record Form and the Manual

The layout of the manual and some modifications were added to the record form. The rationale behind the modifications were due to the difficulties experienced by the author as a test administrator of the battery. These difficulties were reported by some special needs teachers and educational psychologists.

The administration of supplementary alliteration, non-word reading and naming speed tests, requires the child to read and/or name the items displayed. The displays are located in the manual bounded together with the script for test instructions to the child. The frequent manipulation of the script and the display causes inconvenience to the test administrator which makes test administration ineffective and time consuming. Moreover, it was also observed that it had caused distractions to the children which has negative impact on their performances.

Due to these reasons, it is important to modify the manual as well as the record forms which aimed to make the battery more user-friendly and time efficient.

Modifications made to the record forms

- For all the subtests, the new Malay items replaced the English items in the record forms.
- 'Rules for discontinuation' are added in the section for Naming Speed, Rhyme, Spoonerisms and Non-word Reading (Page 4, 5, 6, 7, 9 respectively on the record form, Appendix 4) to prompt and remind the test administrators.
- The stopwatch sign was added to indicate when to start and stop timing, for example in Spoonerisms and Fluency Tests.
- 'Comments Section' is where test administrators gave their feedback on the child's behavior during the test of Alliteration, Supplementary Alliteration and

Naming Speed Test. In the original PhAB this was only available for the Naming Speed Test.

Modifications made to the manual layout

The following items were added in the manual:

- Signposts and symbols are used to direct the examiner of what comes next, to use a stopwatch, to start and stop etc.
- All the displayed items presented to the child are compiled into a separate Display Booklet. The current PhAB included the displays (for examinee) together with the actual manual (instructions for the examiner and the script).
- Thus, the Display Booklet was created for easy access. However, for submission purposes plastic lamination is not used.
- Additional card paper with tabs were labelled and used as dividers to ensure easy access to each subtest.
- The instructions to be read to the child were printed in bold.

In this section, although modifications made to the original PhAB and the rationales of its modification were presented in great details, it should be noted that a greater understanding of the modification made in the Instructions, Items, Record Forms and the Layout can be achieved by making a direct comparison between the original PhAB and the modified version.

2.3 The Process: Language and Administration details

The general process of modification started with the literal translation of PhAB which is in English to Malay language. The translation was made based on the author's own understanding and how she would say it to her daughters. In terms of

administration details, the MPhAB closely followed the way PhAB was administered in the manual.

Then, four qualified Malay language teachers (who were also the research assistants) including the author worked together to ensure that the instructions were clear and able to be followed by the children. The instructions were also ensured that the test administrator feel comfortable delivering the test as a whole.

In order to ensure that the words are commonly used and of high frequency, the author (including the research assistants who are qualified, Bruneian Malay teachers) chose the words based on the common vocabulary used in children's books in schools. This is due to the absence of Malay language word corpus for primary schools in Brunei. The corpus of language contains the common words that occur in the Malay language at which, Brunei has not developed its own version.

It was an intensive process where we performed a survey of textbooks used in primary schools in Brunei and extracted the common words used. The books were selected from the Malay textbooks (Year 1 – 6) and the storybooks used in Malay language curriculum. It is important to note that all Brunei schools; government and private; followed the same SPN21 curriculum except for international schools as recognised by the Ministry of Education. Thus, all the primary schools use the same textbooks and storybooks recommended by the Curriculum Development Department, Brunei.

To ensure that the instructions were clear and able to be followed by children, it was based on the commonly used instructions in schools used by the research assistants who were experienced and qualified Malay teachers. Thus, the initial translation

made was then finely tuned to achieve clear and succinct instructions. This involved the process of doing some alterations, simplification and some simply shortening it.

Once the instructions and items were finalised, each of us tested on a child aged between 6:00 to 11:00 years old. After that, we gathered again and all of us gave feedback on the test administration.

Generally, it was gathered that all the participants understood what was required of them in responding to all the subtests and the test administrators were comfortable in delivering them. However, there are only minor amendments made to make the final version of the modified MPhAB. For example, one complex sentence of the instructions was further simplified to two simple sentences without changing their meanings. The final version of the developed MPhAB can be obtained from Appendix 5.

PhAB has been examined to be a reliable and valid tool in the assessment of phonological awareness and it has also been standardised to the UK population. In the development and modification of a test equivalent to PhAB, it is conventional for the test developers to present the technical information of the assessment, mainly the information about the test's reliability, validity and standardization. This information is usually made available in the test publisher's manual. In order to follow the convention, the aspects of reliability, validity and standardisation of MPhAB would be explored in great details and presented in Paper 2.

3 Sampling

3.1 Schools and participants

A list of government and non-government primary schools nationwide was obtained from the Department of Schools, Ministry of Education. The schools were carefully selected to ensure that the schools that were sampled were representative of the four districts in Brunei i.e. Brunei-Muara, Tutong, Belait and Temburong at which some were from rural, semi-rural and urban areas.

In the original PhAB, a total of 613 children were involved in the data analysis for standardisation and test of validity. This can be considered as a good sample size for a country which has about 50 million population (ONS,1997). However, for MPhAB, with Brunei population of only 395,027 in July 2010 estimation (CIA, 2011), it was decided that the most appropriate sample size is about 200 children (approximately). The decision was made because this was a similar ratio of the population that was adopted in PhAB.

A simple random sampling procedure was used to select the schools for each district and it was also the procedure used to select the students. This strategy was intended to ensure that population of school children sampled represented Brunei population of children as a whole (population of 395,027 in July 2010 estimation, (CIA, 2011)

In the original PhAB which was standardised in the UK, 613 students participated in the standardisation for nine age groups from 6:00-6.11 to 14:00-14:11. For the modified PhAB, an approximation of 200 children is considered to be reasonable for the whole of Brunei population where only six age groups from 6:00 – 6:11 to 11:00 – 11:11 participated in the study. The consideration of the sample size took into

account the feasibility of the researcher to collect the data within the limited time that was carried out during the school term in Brunei but the University's summer holidays in the UK in 2010.

Prior to the actual selection, it was proposed that approximately 10 students participated from each school, thus 20 schools were required. Frederickson and Frith et al (1997) in the original PhAB suggested that testing a few students in a large number of schools would enhance the accuracy of the sample and 6 students were selected for each school. Thus, a similar approach was used in the modified PhAB.

3.1.1 Selection of schools

Both government and non-government (i.e. private) schools were included in the study where some were from rural, semi-rural and urban areas of Brunei.

Table 3.1.The targeted no. of schools per district

DISTRICTS	Population (%)	Targeted No. of schools for each district = Population (%) X 20
Brunei-Muara	66	13
Tutong	10.9	2
Belait	20.2	4
Temburong	2.9	0.58 (rounded off to 1)

The table 3.1 above shows the targeted no. of schools per district. It was obtained by calculating the ratio of the population for each district whereby there are four districts in Brunei. The population of each district is obtained from CIA (2011) for July 2010 estimation.

The targeted number of schools for each district is based on the calculation below. For example, for Brunei-Muara district, the population comprises 66% of the whole Brunei population.

Thus, from the 20 schools needed, the district represents 13 schools. (For Brunei-Muara District, 66% X 20 = 13 schools)

In order to get the school list, all the schools' names per district (non-government and government schools) were thrown into a hat and drawn out one by one until 13 schools were achieved.

The same procedure was repeated for the three other districts as tabulated above. Thus a total of 20 schools were targeted to participate in the research. However, the targeted 20 schools had to be downsized to 19 schools due to time constraints.

11 out of the 20 schools selected, all from the Brunei-Muara district were involved in the re-test. This means that the participants were tested twice within the gap of 4 weeks. The schools involved in the re-test were selected based on accessibility for the author and the RAs to conduct the assessment where most of them were from the Brunei-Muara district. They were the first 132 children who were administered the first test. This was done in order to give ample time for the 4-week gap needed for a retest. The selection of schools for the test and re-test is tabulated below.

Table 3.2.The selection of schools for the test and re-test

Districts in Brunei	No. of schools targeted	No. of schools involved	Type of school	List of schools involved	Schools involved for the test-retest
Brunei-Muara	13	12	Govern-ment	1) SR Raja Isteri Fatimah	✓
				2) SR Dato Marsal	✓
				3) SR OKSB Kilanas	✓
				4) SR Mentiri	✓
				5) SR Kiarong	✓
				6) SR Pintu Malim	✓
				7) SR Pehin Datu Jamil	✓
				8) SR Katok	✓
				9) SR Panglima Berudin	✓
			Private	10) St Andrew's	✗

				School	
				11) Stella School	✓
				12) Sekolah Yayasan Sultan Haji Hassanal Bolkiah	✓
Tutong	2	2	Govern-ment	1. SR Lubok Pulau	✗
				2. SR Muda Hashim	✗
				3. SR Lamunin	✗

Belait	4	4	Govern-ment	1. SR PSJ Pandan	✗
				2. SR Sg Liang	✗
				3. SR Lamunin	✗
			Private	4. SR St Angela's School	✗
Temb-urong	1	1	Govern-ment	1. SR Batu Apoi	✓
TOTAL	20	**19**		TOTAL (re-test)	**11**

3.1.2 Selection of Participants

The students from Year 1, 3 and 5 were selected for the following reasons:

Year 1: They were assumed to have been exposed to the school environment. They have been taught the basic literacy skills during preschool for at least 1 year and aged between 6 to 7 years old.

Year 3: They have been taught literacy for approximately 4 years and aged between 8-9 years old.

Year 5: They have been taught literacy for approximately 6 years. They were aged between 10-11 years old.

The number of years the students spent in school is taken into consideration during the selection of year groups. Additionally, the year groups chosen ensured the wide range of ages from 6:00 to 11:00 year old students.

The selection of students were made randomly by year group whereby for each school, the headteacher was assigned to prepare the students' list in year groups as

follows; Year 1, 3 and 5. For each year group, every fifth student were chosen to be a participant and 4 participants were chosen, thus, a total of 12 participants in each school.

Out of 228 students who participated in the study, 2 participants were removed from the analysis due to the students' request to withdraw. There were only 11 participants from the age group of 11:00 – 11:11.

However, later in Paper 2, the results were generated by age group. The students participated in the study are as follows:

Table 3.3. Number of participants by age groups

	6:00 – 6.11	7.00 – 7.11	8.00 – 8.11	9.00 – 9.11	10.00 – 10.11	11.00 – 11.11
No. of participant	46	33	54	22	60	11
Mean age	**6.08**	**7.03**	**8.07**	**9.04**	**10.06**	**11.00**
Minimum age	6.04	7.00	8.00	9.00	10.00	11.00
Maximum age	6.11	7.07	8.11	9.11	10.11	11.03

The participants' background details were obtained by the assessor at the beginning of the assessment. These details were gathered:

- Gender
- Date of birth
- Year group
- Whether the child has special educational needs
- Mother tongue

From the sampling strategy discussed, the goal was to choose a representative sample of Brunei population. This includes ensuring that no gender and race biases,

children were selected from a variety of schools scattered from the four districts. Moreover, the children were selected from different school levels of Year 1, 3 and 5.

From the sample chosen above, a total of 226 students were administered the MPhAB for the purpose of standardisation and from the total, 132 students were administered MPhAB twice for the purpose of test-retest.

4 Test Administration

This section will explain in detail the way the test is administered and scored in a consistent way. This is important to ensure that the test is standardised thus, requires the test to be designed in such a way that the questions, environmental conditions, scoring procedures, the recruitment and training of research assistants and interpretations of the scores are consistent in a predetermined and standard manner.

Prior to the administration of the modified PhAB in Brunei, it is important to get approval from the relevant authorities in Brunei, particularly, the Ministry of Education which functions as the main local education authority in Brunei. Since this research sample involves children in both government and private primary schools, approval is needed from the relevant departments under the Ministry of Education. For the government schools, approval from the Director of Schools (Primary Section) is needed and for the private schools, approval from the Private Institutions Section.

Formal letters were sent to the aforementioned authorities (Appendix 6) requesting for permission to conduct a research on the respective schools. Attached with the letter should include the research proposal and a supporting letter from the research supervisor. The letter also stated the list of schools proposed in the study. 3 weeks

after submission, permission letters to conduct the research in schools were obtained (Appendix 7). Although not written in the letter, it is conventional for any research to adhere to school's protocols.

Once the approval was obtained, the researcher directly contacted the schools (in the approval letter) via telephone to confirm with the head teachers of each school regarding the permission. Each school should have received a copy of the approval directly from the relevant authorities in the Ministry of Education. However, in some cases, particularly in the rural areas, there was a slight delay in the receipt of the letter. Once the random sampling was conducted by the school, and the names of participants were obtained, a letter was sent to parents/guardian of the selected children for consent (Appendix 8)

These processes were done when the author was still in the United Kingdom in June 2010. This gave the author an ample time to interview and select the research assistants before going to Brunei for the data collection which is due to commence in July 2010.

4.1 The Recruitment of Research Assistants

The research assistants (RA) are qualified teachers teaching Malay language in primary schools. They are graduates from BA (Hons) from Universiti Brunei Darussalam (UBD) and they have experience in teaching children.

Six names were nominated by one of the lecturers at Sultan Hassanal Bolkiah Institute of Education, UBD, Cikgu Aliamat bin Omar Ali. The applicants were requested to send their curriculum vitae via email and the interview date and time were set. A summary of the essential and desirable criteria for the selection were made known to the candidate before the interview. The interview was done via video

conferencing facilities i.e. Skype. It had to be done this way due to the differences in geographical location.

The research assistants were shortlisted to 4 and the selection were based on the following criteria:

Essential criteria

- Having own transport and a valid driving license.
- Able to travel via boats and drive long distances to the rural places in Brunei.
- A minimum of two years teaching experience – in teaching young children Malay language or any related fields.
- Demonstrated ability to work well in a team.
- Demonstrated high level of communication and interpersonal skills when relating to students, parents and other teachers.
- A valid and most recent Police Certificate of Good conduct

Desirable criteria

- Strong interest in doing research projects

Four out of six applicants were selected as having those criteria. The rejected applicants were due to limited teaching experience and one of them not having a valid driving license. The shortlisted applicants and the rejected ones were notified.

4.2 The Training of Research Assistants (as Test Administrators)

The research assistants were also involved in the development process. They were involved in the further adjustments of the instructions and items in the MPhAB. Thus the adjustments were done concurrently with the training where I personally trained

them (see MPhAB development & training, Appendix 9). The training was held at the Special Education Unit, Training rooms (3rd floor and ground floor).

The rationale of the training is to ensure that the RAs that should not deviate from the procedure I described and to ensure that their delivery of the test was standard.

In order to ensure that the training instructions were followed accordingly, a comprehensive training program was conducted which was divided into 5 main parts;

Part 1: Introduction to PhAB & rationale and test battery development (details from the original manual). This is to ensure that the background to the development of PhAB and its rationale of adaptation to Brunei context were understood.

Part 2: Testing procedures and standards. The RAs are trained as teachers from the same local university where the core module includes Assessment in schools and Educational Testing. Thus, this is not new for them. This session was more like a revision to them.

Part 3: Training of Modified PhAB (Alliteration test, Supplementary Alliteration test, Naming speed test, Rhyme test, Spoonerisms test, Fluency Test). The instructions for each test were practiced together with the RAs to ensure that it was delivered in a standard way.

Part 4: Debriefing to participants & practice with other RAs. The rationale and procedure for debriefing the participants were discussed. The RAs were given ample time to practice delivering the tests to other RAs and they were advised to practice administering the MPhAB to anyone but preferably children between 6-11 years old. This is to ensure that they become familiar with the procedure.

Part 5: Assessing the RAs as test administrators & giving feedbacks. Each RA was assigned a student for the assessment of their capabilities as test administrators.

They must follow the procedures and guidelines taught during the training and the instructions stated in the MPhAB manual.

It was found that all the RAs were able to deliver the test and followed the procedure as described in the MPhAB manual. They were also able to maintain a good rapport with the student they assessed and gave encouragement where needed.

After the training, preliminary school visits were made with the RAs as a courtesy call to the school's headteachers, to familiarise them with the school's environment, to check the condition of the assessment room and also checking the random selection of students made for each school.

I subsequently made unannounced visits whilst testing was going on to ensure fidelity to the test procedures. I am confident that as a result of the training and inspections, the MPhAB was administered in a standard way.

5 Summary / Conclusion

The PhAB used for children in the UK was translated and adapted to Malay for Bruneian children. The Modified PhAB (MPhAB) is aimed to be an important indicator of specific-reading difficulties experienced by the Bruneian children. Thus, to benefit schools and the Brunei Educational Psychology Service, Malay instructed assessment is aimed to accommodate the difficulties faced by students and the professionals working with them.

However, to fulfill the criteria of a phonological awareness assessment, the MPhAB would have to be tested on its reliability and validity to fulfill the psychometric criteria of good quality assessment (Anastasi, 1968).

For the purpose of publication, the standardised scores obtained would create a baseline for Bruneian children norms. The standardised scores would be useful for

test users where comparison between an individual with the nationally representative sample can be made.

The gaps in the development of MPhAB would be addressed in the Paper 2 which explored the reliability, validity and standardised scores.

Paper Two:

The test of validity and reliability of the modified PhAB and standardisation to Brunei-Malay children

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Paper Two

1 Introduction

As part of the development of the modified PhAB, this study aimed to explore the technical properties of the MPhAB by focusing on its reliability and validity of the MPhAB and the standardization to Brunei norms.

Reliability and validity are important aspects in the development of any tests to present the evidence that it is stable over time and it measures what it claims to measure which then, fulfills the psychometric criteria of good quality assessment (Anastasi, 1968).

This was supported in the original version where it was found that PhAB is a reliable and valid tool to assess the phonological processing skills.

For the purpose of examining the aspects of reliability, validity and standardization of the MPhAB, the raw data obtained during the test administration (in *Test Administration section,* Paper 1) were analysed where comparison will be made between the results of the original version with the modified one. The data presented will be useful in determining if the development of MPhAB presented in Paper 1 is valid and reliable.

2 Results

The results are presented in three sections under the following headings: reliability, validity and standardization. The data was collected and Statistical Package for Social Sciences programme (SPSS Version 18.0) was used for recording the data and for most of the data analyses.

2.1 Reliability

Reliability is an indicator that a test consistently measures what it is purported to measure over time. The reliability of MPhAB was established by the use of internal consistency method, the analysis of standard error of measurement and using the test-retest. However, the test-retest reliability analysis was not performed in the original PhAB.

2.1.1 Test-retest reliability

In the test-retest reliability check, this involves administering the MPhAB twice to the 132 children (out of 226 children who were administered the MPhAB) with an interval between two administrations of 4 weeks. Therefore each child will yield two scores for each subtest, which are then correlated to give the test-retest reliability correlations coefficient.

The test-retest reliability correlation coefficient indicates how consistent the measure is over time. It is often difficult to know the time interval that should be allowed to elapse between the first and second administration of the test. If it is too short, assurance cannot be made as the children may have merely remembered what they did the previous time. If it is too long, particularly where developmental changes are taking place, changes in score may reflect unreliability or developmental change. Thus, four weeks was selected as a compromise time that also fitted in with the

school schedules in Brunei and the test author's availability to collect data and monitor the test administration of the research assistants.

The selection of children involved in the retest are the first 132 children who were administered the MPhAB. This was done to give time allowance of 4 weeks before the second test could be administered by the same test administrator in the first test.

To perform the analyses, the raw scores obtained during both occasions were correlated using Pearson's Product-Moment correlation, which yielded correlation coefficients, *r*. This method was used to analyse all the subtests in the MPhAB across the combined age groups and the whole sample.

The test-retest correlation coefficients (*r*) are provided in the table below.

Table 2.1 (a-d). MPhAB: Means, standard deviation and test-retest correlation coefficients

a) For the **whole sample***:* Age *6:00 – 11:11 (N=132)*

Subtests	TEST		RETEST		*r*
	Mean	SD	Mean	SD	
Alliteration	6.85	2.972	7.78	2.747	.721**
Supplementary Alliteration	7.40	2.331	7.81	2.289	.736**
Picture Naming Speed Test	115.394	31.147	108.909	28.251	.851**
Digit Naming Speed Test	65.22	30.07	60.727	26.153	.907**
Rhyme	15.97	5.058	16.69	4.836	.818**
Spoonerism	13.67	9.874	16.18	10.497	.917**
Fluency Test: Semantic	14.86	4.386	15.01	4.236	.597**
Fluency Test: Alliteration	8.40	3.650	9.33	4.088	.663**
Fluency Test: Rhyme	3.57	2.829	3.95	2.794	.645**
Non-word Reading Test	13.03	6.272	13.58	6.375	.880**

** Correlation is significant at the 0.01 level (2-tailed)

b) For the age group 6:00 – 7:11 (N= 47)

Subtests	TEST		RETEST		*r*
	Mean	SD	Mean	SD	
Alliteration	5.47	3.30	6.26	3.20	.699*
Supplementary Alliteration	6.36	2.55	6.81	2.51	.589**
Picture Naming Speed Test	139.87	32.27	130.21	24.70	.727**
Digit Naming Speed Test	88.64	33.77	82.17	30.20	.954**
Rhyme	13.19	5.492	14.68	5.21	.779**
Spoonerism	6.85	5.56	8.79	7.55	.307**
Fluency Test: Semantic	11.87	2.98	12.68	3.90	.462**
Fluency Test: Alliteration	6.51	3.13	7.81	3.77	.554**
Fluency Test: Rhyme	1.98	1.82	2.64	2.069	.458**
Non-word Reading Test	11.15	6.40	11.34	6.66	.874**

** Correlation is significant at the 0.01 level (2-tailed)

c) For the age group 8:00 – 9:11 (N= 42)

Subtests	TEST		RETEST		*r*
	Mean	SD	Mean	SD	
Alliteration	7.05	2.88	8.28	2.28	.566*
Supplementary Alliteration	7.79	1.86	8.12	2.06	.797**
Picture Naming Speed Test	107.43	22.28	105.02	26.96	.855**
Digit Naming Speed Test	55.21	13.00	54.33	13.93	.939**
Rhyme	16.79	4.094	17.45	4.145	.828**
Spoonerism	14.45	9.69	17.48	9.96	.885**
Fluency Test: Semantic	15.36	4.20	15.52	3.99	.659**
Fluency Test: Alliteration	8.90	3.28	9.48	4.11	.631**
Fluency Test: Rhyme	3.76	2.62	4.07	2.93	.623**
Non-word Reading Test	13.36	6.22	14.12	6.24	.838**

** Correlation is significant at the 0.01 level (2-tailed)

d) For the age group 10:00 – 11:11 (N=43)

Subtests	TEST		RETEST		*R*
	Mean	SD	Mean	SD	
Alliteration	8.16	1.91	8.98	1.739	.795**
Supplementary Alliteration	8.16	2.13	8.60	1.853	.820**
Picture Naming Speed Test	96.42	17.31	89.49	14.14	.844**
Digit Naming Speed Test	9.40	20.89	43.53	9.35	.450**
Rhyme	18.21	4.00	18.14	4.389	.804**
Spoonerism	20.37	8.95	23.00	8.61	.933**
Fluency Test: Semantic	17.65	3.85	17.05	3.645	.292
Fluency Test: Alliteration	9.98	3.69	10.84	3.89	.678**
Fluency Test: Rhyme	5.12	3.25	5.26	5.26	.592**
Non-word Reading Test	14.77	5.74	2700	2.70	.910**

** Correlation is significant at the 0.01 level (2-tailed)

As shown in Table 2.1a above, when correlation coefficients were computed for the whole sample, there was a significant, positive relationship between the test and retest for all the subtests of MPhAB at $p < .01$. Thus indicating that, the children's high performance in one test, when repeated, performed as high as the first test. Across the whole sample, Spoonerism test has the strongest correlation coefficient between the test and the retest with $r_{spo1.spo2}$ (132) = .917, $p < .01$ and the second strongest subtest is the Digit Naming Speed test retest

$r_{dn1,dn2}$ (132) = .907, $p < .01$.

However, the correlation between scores in the Fluency test: Semantic for age group 10:00 – 11:11 is not significantly correlated, where

$r_{FTSem1RFTSem2}$ = .292 (43).

The overall test reliability in the test-retest for all the combined age group was found to be positive and significantly correlated at $p < .01$.

2.1.2 Internal Consistency

Another way of checking the test's reliability is through the internal consistency of each subtest. The PhAB battery comprises of six phonological subtests (Frederickson, Frith et al, 1997) and one Supplementary Alliteration test for children who are poor at the Alliteration test. For the purpose of standardization, all the children were subjected to the Supplementary Alliteration test regardless of their performances in the Alliteration test. Each child was assessed on their ability to process sounds in spoken language.

Internal consistency: PhAB and MPhAB

For the internal consistencies check for both PhAB and MPhAB, the most common indices of reliability is using the Cronbach's correlation alpha (also known as Cronbach's alpha, α) . The Cronbach's alpha was generated from the data using SPSS. It is a measure of whether each test question measures the same thing; any individual items where they scored highly should be associated together and vice versa.

A combination of age groups were analysed in the data in order to give reasonable numbers for the item analysis. In PhAB, the age groups were 6:00 – 7:11, 8:00 – 9:11, 10:00 – 11:11 and 12:00 - 14:11 and in MPhAB, the age groups were 6:00 – 7:11, 8:00 – 9:11 and 10:00 – 11:11.

The Cronbach's alpha is interpreted like a correlation coefficient where the coefficient varies between 0 and 1, for coefficients nearer to 1, the more internally reliable the test.

For both the Naming Speed test and the Fluency test, the Cronbach's correlation alpha could not be computed due to the nature of the test which are speeded test

where the results are related to time and performance. Thus, it is not appropriate to run the internal consistency measures.

Internal consistency: PhAB

The Cronbach's coefficient alpha, maximum scores, mean scores, standard deviations and the standard error of measurement (SEM) for the PhAB subtests are presented in the Table 2.2. below (Source: PhAB manual, Pg 75).

Table 2.2. PhAB: Internal consistency reliability coefficients (Cronbach's Coefficient Alpha). Maximum score, mean scores and standard deviations for each test (and SEM).

Table A2.4 Internal consistency reliability coefficients (Cronbach's coefficient alpha). Maximum score, mean scores and standard deviations for each test (and SEM)

For the age group 6:00–7:11

Subtest	Alpha	Maximum	Mean score	Standard deviation	SEM
Alliteration	0.90	10	7.17	3.15	1.00
Alliteration with Pictures	0.82	10	8.55	2.11	0.90
Rhyme	0.92	21	10.43	5.86	1.66
Spoonerism	0.95	30	8.32	8.08	1.81
Non-Word Reading	0.95	20	7.95	6.35	1.42

For the age group 8:00–9:11

Subtest	Alpha	Maximum	Mean score	Standard deviation	SEM
Alliteration	0.84	10	8.84	2.05	0.82
Alliteration with Pictures	0.80	10	9.20	1.60	0.72
Rhyme	0.91	21	15.75	5.03	1.51
Spoonerism	0.93	30	14.49	8.35	2.21
Non-Word Reading	0.96	20	12.03	6.71	1.34

For the age group 10:00–11:11

Subtest	Alpha	Maximum	Mean score	Standard deviation	SEM
Alliteration	0.82	10	9.40	1.46	0.62
Alliteration with Pictures	0.67	10	9.72	0.81	0.47
Rhyme	0.91	21	17.10	4.65	1.40
Spoonerism	0.91	30	18.53	7.85	2.36
Non-Word Reading	0.96	20	14.40	6.30	1.26

For the age group 12:00–14:11

Subtest	Alpha	Maximum	Mean score	Standard deviation	SEM
Alliteration	0.83	10	9.76	0.97	0.40
Alliteration with Pictures	0.19	10	9.90	0.34	0.31
Rhyme	0.83	21	18.33	3.17	1.31
Spoonerism	0.89	30	21.00	6.98	2.32
Non-Word Reading	0.95	20	15.18	5.84	1.31

For the PhAB, the SEM has been calculated using the reliability coefficients and the standard deviations of the raw scores for each test. It varies for each test being assessed and for each age group band. As can be seen from the figures in Table A2.4, the consistency of performance is good, since the SEM figures are low especially in relation to the standard deviation of scores.

Table 2.2 shows that most coefficients are above 0.8 for all the tests across the age group. This indicates high levels of consistency.

The internal consistency of the Alliteration test (age group: 10:00 – 11:11) is α=0.82. In the Supplementary Alliteration test, the internal consistency for the age group 10:00 – 11:11 is α=0.67 and the lowest for the age group 12:00 – 14:11 is α=0.19. As reported in the PhAB manual;

"The results for all tests suggest extremely high levels of internal consistency. Most coefficients are above 0.8 for all tests, across the four group bands. The coefficients for the Alliteration test with pictures (i.e. supplementary alliteration test) in the two highest age group bands suggests lower levels of internal consistency. This reflects the fact that this test is far too easy for children above ten years old and hence, there is little variation in the scores. This test is only intended as an additional diagnostic tool for children who find the Alliteration test too difficult and, in general, this tends to be only the very young children." *Source: PhAB manual, Page 75*

Internal consistency of MPhAB

In the MPhAB, the analysis for internal consistency is similar to the original PhAB. The table below shows the internal consistency reliability coefficients (Cronbach's coefficient alpha, α), maximum scores, mean scores, and standard deviations for each test.

Table 2.3. MPhAB: Internal consistency reliability coefficients (Cronbach's coefficient Alpha), Maximum score, mean scores and standard deviations for each test.

(a) For age group 6.00-7.11 (N=79)

Subtest	Alpha (α)	Maximum	Mean Score	Standard Deviation
Alliteration	0.886	10	5.29	3.375
Supplementary Alliteration	0.821	10	6.04	2.848
Rhyme	0.856	21	12.75	5.810
Spoonerism	0.873	30	5.61	5.108
Non-word Reading	0.908	20	10.82	6.300

(b) For age group 8.00-9.11 (N=76)

Subtest	Alpha (α)	Maximum	Mean Score	Standard Deviation
Alliteration	0.839	10	7.61	2.664
Supplementary Alliteration	0.756	10	7.58	2.143
Rhyme	0.896	21	16.86	4.606
Spoonerism	0.949	30	15.45	10.321
Non-word Reading	0.923	20	13.05	6.096

(c) For age group 10.00-11.11 (N=71)

Subtest	Alpha (α)	Maximum	Mean Score	Standard Deviation
Alliteration	0.619	10	8.06	1.992
Supplementary Alliteration	0.751	10	8.20	1.917
Rhyme	0.856	21	18.30	3.470
Spoonerism	0.929	30	21.27	8.467
Non-word Reading	0.904	20	15.45	5.239

Similar to PhAB, the results for all the subtests in MPhAB suggest extremely high levels of internal consistency where most coefficients are more than 0.8 except for Alliteration test in the 10:00 – 11:11 group (see Table 2.3c) where α is 0.619.

2.1.3 Standard Error of Measurement (SEM)

SEM is an estimation error to be used in interpreting an individual's test score. In classical test theory, the test score a child obtains is only an estimate of a 'true' score.

When notated algebraically, O = T+E. Where O is the 'obtained test score', T is the 'true' score and E is the 'error'.

The 'true' score is always unknown because no such measure can construct a true score that has zero standard error.

The E in this case, is the chances of the obtained test scores changing from one testing occasion to another. This is the extent of variation due to the test error at which the SEM can reveal and this is directly related to the test reliability. This means that the larger the SEM, the less reliable the test is. The more reliable a test is, the more precise the measures and the scores obtained.

In PhAB, the error of measurement (also known as standard error of measurement) was calculated using the reliability coefficients and the standard deviation of the raw scores of each tests as shown in Table 2.2. (source: PhAB manual). The standard error of measurement is inversely related to the reliability, thus, as reliability increases, the SEM decreases and confidence in the observed test score increases. Table 2.2 shows that the SEM figures are low which suggests high reliability for all the subtests.

In MPhAB, a similar approach was used to calculate the SEM. The calculation is obtained directly from the reliability coefficients and the standard deviation, using the formula: $SEM = \sigma\sqrt{1-r}$

where: **SEM** is the standard error of measurement

r is the reliability coefficient

σ is the standard deviation

Thus, for each of the subtest across the combined age group, the SEM was calculated and shown in Table 2.4 below:

Table 2.4 (a-c). Internal consistency reliability coefficients (Cronbach's coefficient alpha), standard deviation and standard errors of measurement for each test.

(a) For age group 6.00-7.11 (N=79)

Subtest	**Alpha**	**Standard Deviation**	**SEM**
Alliteration	0.886	3.375	1.14
Supplementary Alliteration	0.821	2.848	1.20
Rhyme	0.856	5.810	2.20
Spoonerism	0.873	5.108	1.82
Non-word Reading	0.908	6.300	1.91

(b) For age group 8.00-9.11 (N=76)

Subtest	**Alpha**	**Standard Deviation**	**SEM**
Alliteration	0.839	2.664	1.07
Supplementary Alliteration	0.756	2.143	1.06
Rhyme	0.896	4.606	1.49
Spoonerism	0.949	10.321	2.33
Non-word Reading	0.923	6.096	1.69

(c) For age group 10.00-11.11 (N=71)

Subtest	Alpha	Standard Deviation	SEM
Alliteration	0.619	1.992	1.23
Supplementary Alliteration	0.751	1.917	0.96
Rhyme	0.856	3.470	1.32
Spoonerism	0.929	8.467	2.26
Non-word Reading	0.904	5.239	1.62

In PhAB, the SEM ranged from 0.31 to 2.36 across the subtests and age groups. This was reported to be a good indicator of the reliability of PhAB. Compared to MPhAB, the SEM is relatively small which ranged from 0.96 to 2.33. Thus, suggesting that the MPhAB is also a reliable test to measure phonological awareness of Brunei, Malay children.

2.2 Validity

It is an examination of how well a test actually measures what it claims to measure. The evidence available from the interpretation of the scores will support the validity of the subtests at which, a crucial indicator of test quality (Anastasi, 1988).

There are many ways of examining the validity of a test. In PhAB, the three dimensions of validity discussed were content validity, construct validity and critierion-related validity. However, in the MPhAB, only the content validity and construct validity were examined. The criterion-related validity could not be examined due to the limitation of tests comparable to Brunei context such as the Neale Analysis of Reading Ability (NARA) and BAS II. In addition, reading-related assessments similar to the aforementioned assessments and suitable for Brunei context are not available to date. Moreover, the modified PhAB is the first attempt to assess the phonological awareness of Bruneian children.

In order to proof the validity of a test, it is an ongoing process based on multiple investigations and methodologies (Crocker & Algina, 1986). Thus, the findings presented in this study should be regarded as an initial examination of the test's validity.

2.2.1 Content validity

In the original PhAB, content validity was established deductively by defining what the test has intended to measure. Such intention was established in the subtests of PhAB (see Appendix 2 for description of subtests). In the development of the original PhAB, it follows the theoretical construct of phonological awareness mentioned in Frith's theoretical framework (1995). The theoretical basis for the PhAB is consistent with the view that psychological measurement should be interpreted with respect to the underlying theoretical constructs (Crocker & Algina, 1986)

In the modified version, although the instrument was translated and further developed to suit Brunei context, the developed items and instructions were treated with greater caution to ensure that the measures adopted did not affect the test validity. Thus, maintaining the constructs of the theoretical framework originally adopted in PhAB's development (see Paper 1: Instrument development). This indicates that the development of MPhAB is considered to be a valid tool to measure children's phonological processing skills.

2.2.2 Construct validity

This can be viewed as an overarching term to assess the degree to which a test measures the underlying concept it sets out to measure. There are a number of ways to establish and describe the construct validity of a test. In PhAB, the evidence

presented is using the intercorrelations between scores in subtests and the performance scores of the children across age groups.

PhAB is a test to measure phonological processing. All the subtests in PhAB were set to measure the ability of children to process sounds in spoken language except for the Semantic Fluency Test. It was included in PhAB for comparison purposes, not intended to measure the phonological processing. The Non-word reading test, however, is the best available measure of phonological processing (Siegel and Heaven, 1986). The Supplementary Alliteration Test is an additional diagnostic test for children who are not performing well in the Alliteration test. Alliteration test is too easy for older children (age group 12:00 – 14:11) and it is expected for the older children to achieve the maximum score. This suggests that it is irrelevant for older children.

PhAB: Intercorrelations

The intercorrelations coefficients examined between subtests indicate the existence and strength of the relationship. In PhAB, the correlations for the whole sample are significant and positive. Across age groups, the intercorrelations are fairly consistent with the intercorrelations for the whole sample. The majority of the coefficients are positive and significant at either $p<0.01$ or $p<0.05$ level.

The following was set to describe the intercorrelations coefficients obtained between subtests.

- If the coefficient is below **0.65**, it shows that the association between subtests are from moderate to high. The child's high score on one test is related to their scores on other tests.
- If the coefficient is **too high**, one of the tests in the pair would be redundant

- If the correlation is **too low**, this shows that one of the test, which is intended to measure phonological processing, is paired with a test which is not intended to measure phonological processing.

(*adapted from PhAB Manual, Pg 77*)

PhAB: Performance on tests

Another evidence presented for PhAB's validity is examined by its predictability of developmental changes over time. Since PhAB is a developmental test, it is assumed that the scores will increase as age increases. This is an evidence of construct validity that the child's mean performance scores increases with age and in the case of Naming Speed Test (Pictures and Digits), the time to complete the test decreases with age.

MPhAB: Construct validity

The construct validity in PhAB is similarly adopted in MPhAB, where the validity of the test is examined through the intercorrelations between scores and the performance on tests.

The intercorrelations were made between subtests. To perform the analyses, the raw scores obtained for each subtests were correlated using Pearson's Product-Moment correlation, which yielded correlation coefficients, *r*. This method was used to analyse all the subtests in the MPhAB across the combined age groups and the whole sample. The combined age groups were used in the analysis so that comparisons can be made with the original PhAB. The correlation coefficients were presented below.

Table 2.5 (a) Intercorrelations of MPhAB tests across the whole sample (N=226)

	Alliteration	Supplementary Alliteration	Naming Speed Pictures	Naming Speed Digit	Rhyme	Spoonerisms	Fluency (Semantic)	Fluency (Alliteration)	Fluency (Rhyme)	Non-Word Reading
Alliteration	1.00									
Supplementary Alliteration	.620**	1.00								
Naming Speed Pictures	.540**	.456**	1.00							
Naming Speed Digit	.450**	.372**	.582**	1.00						
Rhyme	.622**	.682**	.569**	.468**	1.00					
Spoonerisms	.533**	.615**	.511**	.438**	.660**	1.00				
Fluency (Semantic)	.240**	.209**	.429**	.272**	.296**	.379**	1.00			
Fluency (Alliteration)	.383**	.447**	.461**	.409**	.437**	.465**	.425**	1.00		
Fluency (Rhyme)	.459**	.440**	.383**	.268**	.480**	.525**	.342**	.497**	1.00	
Non-Word Reading	.560**	.634**	.419**	-.333**	.612**	.642**	.180**	.366**	.383**	1.00

All coefficients are significant at p<0.01 level (2-tailed)

Table 2.5 (b) Intercorrelations of MPhAB tests for children aged between 6:00-7:11 years (N=79)

	Alliteration	Alliteration with pictures	Naming Speed Pictures	Naming Speed Digit	Rhyme	Spoonerisms	Fluency (Semantic)	Fluency (Alliteration)	Fluency (Rhyme)	Non-Word Reading
Alliteration	1.00									
Alliteration with pictures	.659**	1.00								
Naming Speed Pictures	.465**	.381**	1.00							
Naming Speed Digit	.228*	.102	.148	1.00						
Rhyme	.653**	.642**	.511**	-.193	1.00					
Spoonerisms	.509**	.488**	-.279*	-.180	.490**	1.00				
Fluency (Semantic)	.176	.112	-.305**	.141	.184	-.024	1.00			
Fluency (Alliteration)	.344**	.360**	-.315**	-.224*	.405**	.276*	.249*	1.00		
Fluency (Rhyme)	.321**	.364**	-.195	.064	.464**	.315**	.166	.295**	1.00	
Non-Word Reading	.612**	.659**	-.360**	-.170	.571**	.600**	.114	.451**	.325**	1.00

** Coefficients are significant at p<0.01 level (2-tailed)

* Coefficients are significant at p<0.05 level (2-tailed)

Table 2.5 (c) Intercorrelations of MPhAB tests for children aged between 8:00-9:11 years (N=76)

	Alliteration	Alliteration with pictures	Naming Speed Pictures	Naming Speed Digit	Rhyme	Spoonerisms	Fluency (Semantic)	Fluency (Alliteration)	Fluency (Rhyme)	Non-Word Reading
Alliteration	1.00									
Alliteration with pictures	.473**	1.00								
Naming Speed Pictures	-.418**	-.267*	1.00							
Naming Speed Digit	-.238*	-.345**	.606**	1.00						
Rhyme	.413**	.614**	-.331**	-.251*	1.00					
Spoonerisms	.423**	.671**	-.303**	-.207	.607**	1.00				
Fluency (Semantic)	.041	.008	-.229*	-.231*	.109	.166	1.00			
Fluency (Alliteration)	.316**	.332**	-.404**	-.474**	.287*	.300**	.119	1.00		
Fluency (Rhyme)	.438**	.401**	-.322**	-.224	.445**	.450**	.237*	.418**	1.00	
Non-Word Reading	.514**	.568**	-.315**	-.217	.535**	.643**	.027	.212	.296**	1.00

** Coefficients are significant at p<0.01 level (2-tailed)

* Coefficients are significant at p<0.05 level (2-tailed)

Table 2.5 (d) Intercorrelations of MPhAB tests for children aged between 10:00-11:11 years (N=71)

	Alliteration	Alliteration with pictures	Naming Speed Pictures	Naming Speed Digit	Rhyme	Spoonerisms	Fluency (Semantic)	Fluency (Alliteration)	Fluency (Rhyme)	Non-Word Reading
Alliteration	1.00									
Alliteration with pictures	.442**	1.00								
Naming Speed Pictures	-.207	-.231	1.00							
Naming Speed Digit	-.086	-.081	.398**	1.00						
Rhyme	.430**	.595**	-.293**	-.071	1.00					
Spoonerisms	.397**	.575**	-.261**	-.136	.730**	1.00				
Fluency (Semantic)	-.042	.029	-.155	-.044	.036	.188	1.00			
Fluency (Alliteration)	.035	.354**	-.079	-.044	.161	.247*	.468**	1.00		
Fluency (Rhyme)	.361**	.312*	-.070	-.112	.218	.296*	.129	.393**	1.00	
Non-Word Reading	.349**	.520**	-.262*	-.198	.629**	.673**	.013	.148	.295*	1.00

** Coefficients are significant at p<0.01 level (2-tailed)

* Coefficients are significant at p<0.05 level (2-tailed)

Similar to PhAB, the correlations between subtests are significant and positive where all the coefficients are significant at p<0.01 level. However, intercorrelations between Naming Speed Tests (Pictures and Digits) with other subtests are negative but moderately strong correlations, meaning that as one increases the other decreases. The intercorrelations between the Naming Speed test (Pictures) and Naming Speed test (Digits) is fairly consistent whereby the relationships are moderately strong and positive at p<0.01 level (two-tailed). For example, for the whole sample, r = 0.582 at p<0.01 level (two-tailed).

The intercorrelations between subtests of Alliteration, Supplementary Alliteration, Rhyme, Spoonerism and Non-word Reading Tests showed that the correlations are positive and strong for the whole sample and across age groups. The intercorrelation coefficients are ranged between 0.4 to 0.7 at p<0.01, two-tailed.

In combined age groups, however, when the subtests were correlated with Semantic Fluency Test, there is a weak, positive correlation. This is consistent for all the age groups.

For example, in the 6:00 – 7:11 age group (See Table 2.5b), the correlation coefficients, *r* at p<0.01 (two-tailed) are as follows:

$r_{\text{Semantic Fluency Test. Alliteration}} = 0.178\ (79)$

$r_{\text{Semantic Fluency Test. Supp.Alliteration}} = 0.112\ (79)$

$r_{\text{Semantic Fluency Test. Rhyme}} = 0.184\ (79)$

$r_{\text{Semantic Fluency Test. Spoonerism}} = 0.046\ (79)$

$r_{\text{Semantic Fluency Test. NonWord}} = 0.114\ (79)$

From the correlation coefficients above, there are consistently weak correlations between the five subtests and semantic fluency test.

MPhAB: Performance on tests

Another method of examining construct validity is the developmental changes as the age increases. This suggests that a child's phonological processing will improve over time and that it changes with age. Using the SPSS, the means and standard deviations of all the subtests were obtained for the age groups between 6:00 – 6:11 and 11:00 – 11:11 and summarized in the table below.

Table 2.6. Number of pupils, medians, means and standard deviations for each test and each age group

	Age group					
	6:00 – 6:11	7:00 – 7:11	8:00 – 8:11	9:00 – 9:11	10:00 – 10:11	11:00 – 11:11
a) Alliteration						
N	46	33	54	22	60	11
Median	6.0	6.0	9.0	6.5	8.5	8.0
Mean	**5.2**	**5.4**	**8.2**	**6.2**	**8.1**	**7.8**
Standard deviation	3.4	3.4	2.6	3.1	2.0	2.1
b) Supplementary Alliteration						
N	46	33	54	22	60	11
Median	7.0	7.0	8.0	7.0	9.0	9.0
Mean	**5.8**	**6.3**	**8.0**	**6.6**	**8.3**	**7.5**
Standard deviation	3.1	2.5	1.8	2.6	1.6	3.2
c) Naming Speed Picture						
N	46	33	54	22	60	11
Median	133.0	127.0	106.0	105.0	92.5	100.0
Mean	**142.3**	**136.6**	**110.0**	**107.2**	**94.0**	**97.5**
Standard deviation	43.5	25.0	24.5	20.3	16.3	15.5
d) Naming Speed Digit						
N	46	33	54	22	60	11
Median	75.0	78.0	54.5	50.5	44.0	49.0
Mean	**88.5**	**83.6**	**55.4**	**55.1**	**47.1**	**48.6**
Standard deviation	43.0	30.0	9.8	16.7	18.3	10.3
e) Rhyme						
N	46	33	54	22	60	11
Median	14.5	15.0	19.0	17.5	20.0	18.0
Mean	**12.5**	**13.1**	**17.7**	**14.7**	**18.5**	**17.4**
Standard deviation	5.8	5.9	3.9	5.6	3.3	4.5

f) Spoonerism						
N	46	33	54	22	60	11
Median	4.5	7.0	18.0	8.5	20.0	25.0
Mean	**4.2**	**7.6**	**16.9**	**11.8**	**18.5**	**20.0**
Standard deviation	3.5	6.3	9.7	11.2	3.3	10.3
g) Fluency (Semantic)						
N	46	33	54	22	60	11
Median	12.0	12.0	15.0	17.0	17.0	15.0
Mean	**12.3**	**11.5**	**15.0**	**16.2**	**17.4**	**15.6**
Standard deviation	3.7	3.2	4.6	4.3	4.3	4.3
h) Fluency (Alliteration)						
N	46	33	54	22	60	11
Median	6.5	7.0	9.5	9.0	11.0	7.0
Mean	**6.3**	**6.2**	**9.6**	**8.1**	**10.8**	**7.7**
Standard deviation	3.2	2.9	3.4	3.7	3.3	3.6
i) Fluency (Rhyme)						
N	46	33	54	22	60	11
Median	2.0	2.0	4.2	2.0	4.5	5.0
Mean	**2.2**	**2.0**	**4.0**	**3.1**	**5.2**	**4.2**
Standard deviation	2.1	1.5	2.4	2.9	3.0	2.4
j) Non-word Reading						
N	46	33	54	22	60	11
Median	10.5	15.0	16.0	13.0	17.5	15.0
Mean	**9.8**	**12.2**	**13.9**	**11.0**	**15.8**	**13.6**
Standard deviation	6.2	6.2	5.8	6.4	5.0	6.3

From the table above, there is a consistent increase in the mean scores between age groups of 6:00 – 6:11, 7:00 – 7:11, 9:00 – 9:11 and 10:00 – 10:11 for all the subtests.

However, for age group 8:00 – 8:11, the means are greater for all the subtests than for age group 9:00 – 9:11 except for the Semantic Fluency test.

From the table above, there is a slight decrease in the performance of the age group 11:00 – 11:11 in comparison with age group 10:00 – 10:11.

2.3 Standardization

The standardization of PhAB to the UK population has provided a normative data for children aged from 6:00-6:11 to 14:00-14:11. The PhAB sample was a sub-sample of 629 children who also took the Neale Analysis of Reading Ability (NARA). The sample was weighted within each year group in order to reduce bias. This is to reflect the national distribution of the standardised scores on the NARA comprehension test.

For each age group, the percentiles of 5, 10, 25, 50, 75, 90 and 95 were found and the standardised scores were derived (mean: 100, standard deviation: 15) from the line of best fits inside the range of scatter points. In conjunction with the results of the NARA standardization, some of the scores were again, adjusted and weighted.

The standardized scores for each test were presented in the thesis' Appendix 10: Tables of Standardised Scores. (This can be obtained from the original PhAB manual on Page 113-123)

In order to standardise the MPhAB, the selection and measurement of a normative sample was described under the *Sampling section* (Paper 1). This is to ensure that the sample is representative of the Brunei population.

By converting the raw scores to standardized scores, a comparison of a child's performance with the typical performances of children of the same chronological age can be made.

The process of obtaining the standardized scores began with the assessments of 226 children from ages 6:00 to 11:11. This is considered to be a large sample for Brunei, which has a population of less than half a million.

The construction of MPhAB norms began with an analysis and examination of the descriptive statistics for each subtest scores. The mean scores, medians and

standard deviations were presented in Table 2.6 (in section 2.2.1 *MPhAB: Performance on Tests*)

The means and standard deviations of each subtest across the age group were obtained from the table above. From this, the raw scores were converted to standardised scores.

To convert the raw scores to a standardised score, the equation below was used:

SS = 15 (**z**) + 100
(with a mean of 100 and standard deviation of 15)

where:

SS is the standard score, **z** is the z-scores

The z-scores were obtained by the equation below:

$$\mathbf{z} = \frac{\mathbf{X - M}}{\mathbf{SD}}$$

where:

z is the z-scores, **X** is the raw scores for each subtest.

M is the mean score for each subtest, **SD** is the standard deviation for each subtest.

For example, in the test of Non-word Reading for age group 6:00 – 6:11, after the test has been administered and entered in SPSS, the mean and standard deviation of the scores performed by the children are computed.

By referring to Table 2.6 (j), the mean score is 9.8 (M) and the standard deviation is 6.2 (SD) and the raw scores for the Non-word Reading test ranged from 0 to 20 (X), thus for a raw score of 7 (X), the standardised score will be:

SS = 15 x (7 — 9.8)/6.2 + 100

SS = 93.22

The standard score is conventionally presented as a whole number. Thus, the standard score for a raw score of 7, in the Non-word Reading test is 93.The raw

scores for all the subtests were converted to standard scores, presented in the tables below.

Table 2.7 (a-j). MPhAB: Tables of standardised scores

a) Standardised scores for Alliteration test

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
1	81	81	52	75	46	51
2	86	85	59	80	54	58
3	90	89	66	85	62	65
4	95	93	72	89	69	73
5	99	98	79	94	77	80
6	103	102	85	99	84	87
7	108	106	92	104	92	94
8	112	111	99	109	99	101
9	117	115	105	114	107	108
10	121	119	112	119	114	116

b) Standardised scores for Rhyme Test

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 – 10.11	11.00 - 11.11
1	70	69	35	63	20	45
2	73	72	39	66	24	49
3	75	74	43	69	29	52
4	78	77	47	71	34	55
5	81	79	51	74	38	59
6	83	82	54	77	43	62
7	86	84	58	79	47	65
8	88	87	62	82	52	69
9	91	90	66	85	57	72
10	94	92	70	87	61	75
11	96	95	74	90	66	79
12	99	97	78	93	70	82
13	101	100	82	95	75	85
14	104	102	86	98	79	89
15	106	105	89	101	84	92
16	109	107	93	103	89	95
17	112	110	97	106	93	99
18	114	113	101	109	98	102
19	117	115	105	111	102	105
20	119	118	109	114	107	109
21	122	120	113	117	112	112

c) Standardised scores for Spoonerism Test

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
1	86	85	75	85	62	72
2	91	87	77	87	64	74
3	95	88	78	88	66	75
4	99	89	80	89	68	77
5	103	91	82	91	70	78
6	108	92	83	92	72	80
7	112	93	85	93	73	81
8	116	95	86	95	75	83
9	120	96	88	96	77	84
10	125	98	89	98	79	85
11	129	99	91	99	81	87
12	133	100	92	100	83	88
13	137	102	94	102	84	90
14	142	103	95	103	86	91
15	146	104	97	104	88	93
16	150	106	99	106	90	94
17	154	107	100	107	92	96
18	159	108	102	108	94	97
19	163	110	103	110	95	99
20	167	111	105	111	97	100
21	171	112	106	112	99	101
22	175	114	108	114	101	103
23	180	115	109	115	103	104
24	184	116	111	116	105	106
25	188	118	112	118	106	107
26	192	119	114	119	108	109
27	197	120	116	120	110	110
28	201	122	117	122	112	112
29	205	123	119	123	114	113
30	209	125	120	125	116	115

g) Standardised scores for Non-word Reading Test

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11.00 - 11.11
1	79	73	67	77	56	70
2	81	75	69	79	59	72
3	84	78	72	81	62	75
4	86	80	74	84	65	77
5	88	83	77	86	68	79
6	91	85	80	88	71	82
7	93	87	82	91	74	84
8	96	90	85	93	77	87
9	98	92	87	95	80	89
10	100	95	90	98	83	91
11	103	97	92	100	86	94
12	105	99	95	102	89	96
13	108	102	98	105	92	98
14	110	104	100	107	95	101
15	112	107	103	110	98	103
16	115	109	105	112	101	106
17	117	112	108	114	104	108
18	120	114	111	117	107	110
19	122	116	113	119	110	113
20	124	119	116	121	113	115

e) Standardised scores for Naming Speed Test: Pictures

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
<52	130	130	130	130	130	130
53	130	130	130	130	130	130
54	130	130	130	130	130	130
56	130	130	130	130	130	130
58	130	130	130	130	130	130
60	130	130	130	130	130	130
62	128	130	129	130	129	130
64	127	130	128	130	128	130
66	126	130	127	130	126	130
68	126	130	126	129	124	129
70	125	130	124	127	122	127
72	124	130	123	126	120	125
74	124	130	122	125	118	123
76	123	130	121	123	117	121
78	122	130	120	122	115	119
80	121	130	118	120	113	117
82	121	130	117	119	111	115
84	120	130	116	117	109	113
86	119	130	115	116	107	111
88	119	129	113	114	105	109
90	118	128	112	113	104	107
92	117	127	111	111	102	105
94	117	126	110	110	100	103
96	116	124	108	108	98	101
98	115	123	107	107	96	99
100	115	122	106	105	94	98
102	114	121	105	104	93	96
104	113	120	104	102	91	94
106	113	118	102	101	89	92
108	112	117	101	99	87	90
110	111	116	100	98	85	88
112	110	115	99	96	83	86
114	110	114	97	95	82	84
116	109	112	96	93	80	82
118	108	111	95	92	78	80
120	108	110	94	91	76	78
122	107	109	93	89	74	76
124	106	108	91	88	72	74
126	106	106	90	86	71	72
128	105	105	89	85	69	70
130	104	104	88	83	67	68

Standardised scores for Naming Speed Test: Pictures (continuation)

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
132	104	103	86	82	65	67
134	103	102	85	80	63	65
136	102	100	84	79	61	63
138	101	99	83	77	59	61
140	101	98	82	76	58	59
142	100	97	80	74	56	57
144	99	96	79	73	54	55
146	99	94	78	71	52	53
148	98	93	77	70	50	51
150	97	92	75	68	50	50
152	97	91	74	67	50	50
154	96	90	73	65	50	50
156	95	88	72	64	50	50
158	95	87	70	62	50	50
160	94	86	69	61	50	50
162	93	85	68	59	50	50
164	93	84	67	58	50	50
166	92	82	66	57	50	50
168	91	81	64	55	50	50
170	90	80	63	54	50	50
172	90	79	62	52	50	50
174	89	78	61	51	50	50
176	88	76	59	50	50	50
178	88	75	58	50	50	50
180	87	74	57	50	50	50
182	86	73	56	50	50	50
184	86	72	55	50	50	50
186	85	70	53	50	50	50
188	84	69	52	50	50	50
190	84	68	51	50	50	50
192	83	67	50	50	50	50
194	82	66	50	50	50	50
196	81	64	50	50	50	50
198	81	63	50	50	50	50
200	80	62	50	50	50	50
202	79	61	50	50	50	50
204	79	60	50	50	50	50
206	78	58	50	50	50	50
208	77	57	50	50	50	50
210	77	56	50	50	50	50
212	76	55	50	50	50	50

Standardised scores for Naming Speed Test: Pictures (continuation)

214	75	54	50	50	50	50
216	75	52	50	50	50	50
218	74	51	50	50	50	50
220	73	50	50	50	50	50
222	73	50	50	50	50	50
224	72	50	50	50	50	50
226	71	50	50	50	50	50
228	70	50	50	50	50	50
230	70	50	50	50	50	50
232	69	50	50	50	50	50
234	68	50	50	50	50	50
236	68	50	50	50	50	50
238	67	50	50	50	50	50
240	66	50	50	50	50	50
242	66	50	50	50	50	50
244	65	50	50	50	50	50
246	64	50	50	50	50	50
248	64	50	50	50	50	50
250	63	50	50	50	50	50
252	62	50	50	50	50	50
254	61	50	50	50	50	50
256	61	50	50	50	50	50
258	60	50	50	50	50	50
260	59	50	50	50	50	50
262	59	50	50	50	50	50
264	58	50	50	50	50	50
266	57	50	50	50	50	50
268	57	50	50	50	50	50
270	56	50	50	50	50	50
272	55	50	50	50	50	50
274	55	50	50	50	50	50
276	54	50	50	50	50	50
278	53	50	50	50	50	50
280+	50	50	50	50	50	50

f) Standardised scores for Naming Speed Test: Digits

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
20	120	120	120	120	120	120
22	120	120	120	120	120	120
24	120	120	120	120	119	120
26	120	120	120	120	117	120
28	120	120	120	120	116	120
30	120	120	120	120	114	120
32	120	120	120	120	112	120
34	119	120	120	119	111	120
36	118	120	120	117	109	118
38	118	120	120	115	107	115
40	117	120	120	114	106	113
42	116	120	120	112	104	110
44	116	120	117	110	103	107
46	115	119	114	108	101	104
48	114	118	111	106	99	101
50	113	117	108	105	98	98
52	113	116	105	103	96	95
54	112	115	102	101	94	92
56	111	114	99	99	93	89
58	111	113	96	97	91	86
60	110	112	93	96	89	84
62	109	111	90	94	88	81
64	109	110	87	92	86	78
66	108	109	84	90	84	75
68	107	108	81	88	83	72
70	106	107	78	87	81	69
72	106	106	75	85	79	66
74	105	105	72	83	78	63
76	104	104	69	81	76	60
78	104	103	65	79	75	57
80	103	102	62	78	73	54
82	102	101	59	76	71	52
84	102	100	56	74	70	49
86	101	99	53	72	68	46
88	100	98	50	70	66	43
90	99	97	47	69	65	40
92	99	96	44	67	63	37
94	98	95	41	65	61	34

Standardised scores for Naming Speed Test: Digits (continuation)

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
96	97	94	38	63	60	31
98	97	93	35	61	58	30
100	96	92	32	60	56	30
102	95	91	29	58	55	30
104	95	90	30	56	53	30
106	94	89	30	54	51	30
108	93	88	30	52	50	30
110	92	87	30	51	48	30
112	92	86	30	49	47	30
114	91	85	30	47	45	30
116	90	84	30	45	43	30
118	90	83	30	43	42	30
120	89	82	30	42	40	30
122	88	81	30	40	38	30
124	88	80	30	38	37	30
126	87	79	30	36	35	30
128	86	78	30	34	33	30
130	86	77	30	33	32	30
132	85	76	30	31	30	30
134	84	75	30	30	30	30
136	83	74	30	30	30	30
138	83	73	30	30	30	30
140	82	72	30	30	30	30
142	81	71	30	30	30	30
144	81	70	30	30	30	30
146	80	69	30	30	30	30
148	79	68	30	30	30	30
150	79	67	30	30	30	30
152	78	66	30	30	30	30
154	77	65	30	30	30	30
156	76	64	30	30	30	30
158	76	63	30	30	30	30
160	75	62	30	30	30	30
162	74	61	30	30	30	30
164	74	60	30	30	30	30

Standardised scores for Naming Speed Test: Digits (continuation)

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
166	73	59	30	30	30	30
168	72	58	30	30	30	30
170	72	57	30	30	30	30
172	71	56	30	30	30	30
174	70	55	30	30	30	30
176	69	54	30	30	30	30
178	69	53	30	30	30	30
180	68	52	30	30	30	30
182	67	51	30	30	30	30
184	67	50	30	30	30	30
186	66	49	30	30	30	30
188	65	48	30	30	30	30
190	65	47	30	30	30	30
192	64	46	30	30	30	30
194	63	45	30	30	30	30
196	63	44	30	30	30	30
198	62	43	30	30	30	30
200	61	42	30	30	30	30

g) Standardised scores for Fluency Test: Alliteration

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
0	71	68	57	46	46	46
1	75	73	61	50	50	50
2	80	78	66	55	55	55
3	85	83	70	60	60	60
4	89	88	75	65	65	65
5	94	94	79	69	69	69
6	98	99	84	74	74	74
7	103	104	88	79	79	79
8	108	109	93	84	84	84
9	112	114	97	88	88	88
10	117	120	102	93	93	93
11	122	125	106	98	98	98
12	126	130	111	102	102	102
13	131	135	115	107	107	107
14	136	140	120	112	112	112
15	140	146	124	117	117	117
16	145	151	129	121	121	121
17	149	156	133	126	126	126
18	154	161	138	131	131	131
19	159	166	142	136	136	136
20	163	172	147	140	140	140

h) Standardised scores for Fluency Test: Rhyme

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
0	84	80	74	46	46	46
1	91	90	80	50	50	50
2	98	100	86	55	55	55
3	105	110	92	60	60	60
4	113	120	99	65	65	65
5	120	131	105	69	69	69
6	127	141	111	74	74	74
7	134	151	117	79	79	79
8	141	161	123	84	84	84
9	148	171	129	88	88	88
10	155	181	135	93	93	93
11	163	191	142	98	98	98
12	170	201	148	102	102	102
13	177	211	154	107	107	107
14	184	221	160	112	112	112
15	191	231	166	117	117	117

i) Standardised scores for Supplementary Alliteration test

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
1	77	67	42	68	31	70
2	82	73	50	74	40	74
3	86	80	58	79	50	79
4	91	86	67	85	59	84
5	96	92	75	91	69	88
6	101	98	83	97	78	93
7	106	104	92	102	87	98
8	110	110	100	108	97	103
9	115	116	109	114	106	107
10	120	123	117	120	116	112

j) Standardised scores for Fluency Test: Semantic

Raw Scores	6:00 - 6:11	7:00 - 7:11	8:00 - 8:11	9:00 - 9:11	10:00 - 10.11	11:00 - 11:11
0	50	46	51	46	46	46
1	54	50	55	50	50	50
2	59	55	58	55	55	55
3	63	60	61	60	60	60
4	67	65	64	65	65	65
5	71	69	68	69	69	69
6	75	74	71	74	74	74
7	79	79	74	79	79	79
8	83	84	77	84	84	84
9	87	88	81	88	88	88
10	91	93	84	93	93	93
11	95	98	87	98	98	98
12	99	102	90	102	102	102
13	103	107	94	107	107	107
14	107	112	97	112	112	112
15	111	117	100	117	117	117
16	115	121	103	121	121	121
17	119	126	107	126	126	126
18	123	131	110	131	131	131
19	127	136	113	136	136	136
20	131	140	116	140	140	140
21	135	145	120	145	145	145
22	139	150	123	150	150	150
23	143	154	126	154	154	154
24	147	159	129	159	159	159
25	151	164	133	164	164	164
26	155	169	136	169	169	169
27	159	173	139	173	173	173
28	163	178	142	178	178	178

Tables 2.7 (a-j) present the standardised scores for each test. In the tables that present standardised scores for the Naming Speed Test (Pictures) and the Naming Speed Test (Digits), these scores are based on the assumption made in the original PhAB that the children made no more than two errors. The raw scores are given in two-second intervals.

Similar to any other tests including the original PhAB, the standardised scores on the MPhAB test have a mean of 100 and a standard deviation of 15. The original version of PhAB suggests that:

- Standardised scores in the range of 86 to 114 are regarded as **average**. About 68% of children fall within this range.
- Standardised scores in the range of 115 to 129 are regarded as **above average**. About 14% of children fall within this range.
- Standardised scores of 130 are and higher are regarded as **well above average**. About 2% of children obtain such scores.
- Standardised scores in the range of 71 to 85 are regarded as **below average**. About 14% of children fall within this range.
- Standardised scores of 70 and lower are **very much below average**. About 2% of children obtain such low scores.

(Frederickson & Frith et al, 2007)

In the original PhAB, the percentile ranks were also presented. Percentile ranks are commonly used to clarify the meaning of the standardised scores useful for test users and the administrators to understand what the values signify. The percentile rank is obtained from Table 2.8 Conversion of standardised scores to percentile ranks as shown below.

Table 2.8. Conversion of standardised scores to percentile ranks

Table A6.11 Conversion of standardized scores to percentile ranks

SS	PR*	SS	PR*	SS	PR*
130–132	98+	109	72	91	28
128–129	97	108	70	90	26
126–127	96	107	68	89	24
125	95	106	66	88	22
123–124	94	105	63	87	20
122	93	104	60	86	18
121	92	103	58	85	16
120	91	102	55	84	14
119	90	101	52	83	13
118	89	100	50	82	12
117	87	99	48	81	11
116	86	98	45	80	9
115	84	97	42	79	8
114	82	96	40	78	7
113	80	95	37	76–77	6
112	78	94	34	75	5
111	77	93	32	73–74	4
110	74	92	30	71–72	3
			70	2	

SS = Standardized score; *PR = Percentile rank

From the standardised scores obtained in MPhAB, for a child (in 8:00 – 8:11 age group) who obtained raw scores of **13** in the Non-word reading test (see Table 2.7g), the standardised score is 98 at which, in the UK, it is regarded as ‘average’.

The percentile rank of standardised score of 98 is 45. This shows that in the Non-word Reading, the child did as well or better than 45% of the children in the norm group i.e. 8:00 – 8:11.

The sample of children who participated on the tests suggests that there is an increase in the children’s performances as they grow older. However, it is interesting to examine that the age group 8:00 – 8:11 performed better than the age groups of 7:00 – 7:11 and 9:00 – 9:11. They performed better in most of the tests except for Semantic fluency test, Naming speed test (Pictures) and Naming speed test (Digits).

3 Discussion

The results from various examination of reliability suggest that MPhAB is a reliable tool to measure phonological awareness consistently over time. Moreover, the validity revealed that MPhAB measures what it purported to measure i.e. phonological awareness, phonological production speed and phonological fluency. This supports the findings presented in the original manual of PhAB (Frederickson, Frith et al, 1997). The standardised scores provide a useful indicator of the children's performance in their phonological processing skills. Children who did not do well in the assessment would be known to the teachers at school.

a) Reliability

MPhAB appears to have good test-retest reliability for assessing phonological awareness. This is also supported in the internal consistency reliability check and the standard errors of measurement. Although, in the test-retest reliability check for the semantic fluency test, it was found that the age group 10:00 – 11:11 is not correlated.

This is not a major concern because the test was included to compare the data with other tests in the interpretation of results and also to familiarise the children with the tasks requirements of other fluency tests. Moreover, the inconsistency may be due to a factor of response measures at which the semantic fluency test is involved. It measures the skills for the retrieval of meaning from memory which is not a measure of phonological awareness.

Although the Alliteration test for the age group 10:00 – 11:11 presents the lowest alpha (α=0.619), this does not mean that the children's scores were not associated together. According to Salvucci, Walter et al (1997), for the values of α between 0.50 – 0.80, this is an indicator of moderate reliability. Thus, suggests the test is still a

reliable one.

Moreover, the standard errors of measurement for the Alliteration test suggest that the value of 1.23 is relatively small.

For example, if it was assume that Student A has a score of 6 in the Alliteration test and the SEM equals to 1.23, it can be interpreted with 95% confidence that the student's 'true' score lies in an interval within two SEMs of the observed score i.e. between 5 and 7. This indicates the small variations in the scores, which suggests Alliteration is a reliable test.

b) Validity

The construct validity of MPhAB is established by comparing the performances and intercorrelations between subtests. The interpretation of intercorrelations established from the PhAB manual, suggested that the coefficients below 0.65 showed moderate to high association between subtests. This interpretation will be used to explain the results of this study.

In this study, it is important to look at the association between subtests, which generates three different findings.

- Negative, moderately strong correlations
- Positive, moderately strong correlations
- Positive, weak correlations.

The negative, moderately strong correlations are found between the Naming Speed Test: Pictures and the Naming Speed Test: Digits. This represents skilled performance at speed naming where a skilled performer's score would be lower than an unskilled performer's score (i.e. the time taken to do the task would be shorter for a skilled performer, resulting in a lower score). Hence, the relationship is a negative one. More importantly, though, is the strength of the association rather than the sign.

The positive, moderate to high correlations between the subtests of Alliteration, Supplementary Alliteration, Rhyme, Spoonerism and Non-word reading provide evidence that all the tests are measuring phonological awareness as what it was purported to measure in the theoretical framework of PhAB (discussed in Paper 1: Introduction: Theoretical rationale).

The high validity of the five subtests is also evident when correlated with the Fluency Test: Semantic where positive but weak relationship was found. This is due to the differences in the traits measured. Semantic fluency test is not a measure of phonological awareness and it was included in both PhAB and MPhAB to enable comparison be made between the semantic fluency test with other subtests that specifically measures phonological awareness (Alliteration, Supplementary Alliteration, Rhyme, Spoonerism and Non-word reading tests). When the semantic fluency test is correlated with tests of phonological awareness, it provides evidence of weak association between the subtests. The weak association strongly suggests that the five subtests of Alliteration, Supplementary Alliteration, Rhyme, Spoonerism and Non-word reading are a measure of phonological awareness.

The positive and moderately strong intercorrelations between the Fluency Test: Alliteration and the Fluency Test: Rhyme also shows that there is an association between the two subtests in the measure of phonological fluency. This study suggests that both tests have high validity.

The evidences presented above strongly suggest that MPhAB is a valid and reliable tool to measure the phonological processing skills for the Brunei, Malay children.

The results from the performances on tests across age groups suggested that the scores increases as age increases. This is another evidence about the validity of MPhAB.

The most interesting finding is the age groups of 8:00 – 8:11 and 9:00 – 9:11 for most of the tests. It was found that the children aged between 8:00 – 8:11 performed better than the 9:00 – 9:11. The children aged between 8:00 – 9:11 are the Year 3 children and they were the first batch of children who followed the SPN21 curriculum (Ministry of Education, 2007). In the new curriculum of SPN21, literacy was taught using the TIARA programme (focusing on synthetic phonics for both languages; Malay and English) since they were in pre-school in 2007. When this study was conducted in 2010, the students have been exposed to the new curriculum for approximately 4 years.

The reason for these differences in their performances could be due to the large sample in the age group 8:00 – 8:11 (N=54) and smaller sample for the age group 9:00 – 9:11 i.e. N=22.

However, more research in this area is needed to investigate the differences in the children's performance.

c) Standardisation

The standardisation of MPhAB to Brunei population also suggests that the performance of the 8:00 – 8:11 age group is better compared to the 9:00 – 9:11 age group. As mentioned before, this may be due to the differences in the number of sample. However, further examination of the nationally represented sample for the age groups 8:00 – 8:11 and 9:00 – 9:11 is needed. The data needed to be revisited to find out the age groups.

Although further research is needed for the aforementioned age groups, the most important is the standard scores for age groups 6:00 – 6:11 and 7:00 – 7:11. For age group 6:00 – 7:11, this is the crucial age for early identification of phonological processing skills particularly in determining children with phonological awareness

deficits.

For children with reading difficulties, teachers or specialist teachers are able to administer MPhAB and the scores the children obtained from the tests can be compared with the standard scores of the nationally represented sample obtained in this study. From the comparison made, the children who have reading difficulties particularly those with phonological awareness deficits can be identified at the early stage.

Moreover, with regards to the range of standardised scores for Brunei population, the author would have to consult the education authorities in Brunei for the decisions made for the students as performing at the 'average', 'above average', 'well above average', 'below average' and 'very much below average'.

The standardised scores in the original PhAB were derived in conjunction with the results from the NARA standardization, where the scores were re-adjusted and re-weighted. For MPhAB, this is not feasible due to the unavailability of such test. Additionally, any decisions made on the children's performance must be treated with great caution, considering that it may put them at risk.

Limitations

The limitation of the present study is that the samples were not selected based on the age groups but according to their class levels. For each school, the sample was selected based on the children in Year 1, 3 and 5, which yielded the number of samples for each age group (see Table 3.2 on Paper 1, Section 3: Sampling). Although the selection of the samples was made randomly and it was performed in a systematic way, this is however, inadequate. Since the results analysis was done according to age groups and not according to the level of academic year, it would be ideal to have an equal number of samples for each age group and the participants

are equally distributed across the ages specified in the study. For future work using PhAB, it is highly recommended for the researcher to assign the age groups of participants by following closely to the original PhAB's age groups of 6:00 – 6:05, 6:06-6:11 until 14:06 - 14:11. By having a sample of children with 6 months gap, more precise standardised scores could be obtained and more older children (up until the age of 14:11 years) can be assessed on their phonological processing skills. This will ensure that the sample studied is representative of the Bruneian population. Another limitation to the study is the approach to validate the construct of the MPhAB presented in the results section. In order to check the test's construct validity, the intercorrelation between the subtests was employed which generated three different types of association.

Compared to PhAB, multiple regression analysis was not used in MPhAB, this was due to the unavailability of compatible assessments in Brunei measuring similar or associated skills.

Thus, a systematic and more detailed analysis of construct validity can be achieved through a means of multitrait-multimethod (MTMM) matrix which was established by Campbell and Fiske (1959). The MPhAB would benefit this type of analyses due to the existence of multitraits and multimethods of assessment.

MPhAB purported to measure the overarching phonological processing skills i.e. phonological awareness, phonological production speed, phonological fluency and there is also an inclusion of a test with non-phonological fluency measure. Within the same traits measured, there are different methods employed, which suggests its 'multimethod' process.

In order to construct validate the tests, it has to go through the specific process of convergent and divergent validation whereby the multiple traits are assessed

simultaneously in a test and each of the traits is assessed by a set of measures or measurement methods (Eid, 2000; Marsh & Hocevar, 1983).

Rather than the simple intercorrelation coefficients between the subtests, the MTMM matrix provides a more robust approach to establish a sense of how much method specific variance is induced by the measurement method. It also provides explanation about the uniqueness of the trait MPhAB is purported to measure compared to another trait. Another benefit of using this approach is to strengthen and systematically support the theoretical construct of the phonological framework mentioned in Frith (1995).

4 Contribution and significance

This research had a particular contribution to the Educational Psychology Service in Brunei. Educational psychologists used tests as a routine in their professional practice. It is used as a tool to answer referral questions and also assist them in the decision-making process about a child.

In Brunei, where there is no test available suitable for its context, this is a constant challenge for the Educational Psychology Service. With the development of the test such as the modified Phonological Assessment Battery, it is hoped to encourage more researchers in the education to shift their focus on developing assessments that are specific to Brunei context. In particular, development of psychological or attainment tests for the Educational Psychology Service. Since MPhAB has described its development process and the rationale behind the modifications made, it can be used as a model to provide references for such test development to be replicated.

From a practical and professional perspective, with the development of a test normalised to Brunei population a comparison can be made about the child's performance in relation to other children in the age group sample. This is useful information that will enable the professional and specialist teachers who worked with the child to better target the scarce resources in Brunei.

Moreover, this research has made a significant contribution by developing a tool for use in the diagnoses of a key element in literacy difficulties i.e. phonological awareness. It also provides preventative measures for the children who are at risk of these difficulties to be identified as early as six years old.

From the identification of children who are at risk of literacy difficulties, the information from MPhAB leads to the identification of the most appropriate course of remedial intervention tailored to individual needs.

Moreover, MPhAB can be used as a tool for measuring the effectiveness of the new literacy programme as stated in the new literacy programme handbook called the TIARA programme. (Ministry of Education, 2010)

Lastly, MPhAB is designed to be user-friendly and less challenging to administer compared to the original PhAB. This encourages more examiners to use it frequently and with the increased usability, improvements on MPhAB can be made which also promotes future research on the phonological processing skills of the children in Brunei.

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Appendix 1: The Evaluation of the Preliminary Modification of PhAB (A comparison with the original PhAB)

1) Instructions

- The instructions were not translated for all the subtests except for the Spoonerisms test.
- Although it was translated, it was very limited to instructions for the assessed children not for the test administrators. For example:

Original PhAB	**Preliminary Modification (i.e. Attempted Modification version)**
Refer Page 30, Frederickson, Frith & Reason (1997) Part 2 test items **Begin timing** when you say the first word. As soon as the child responds to an item – by giving an answer or saying, 'don't know' – you should present the next item. If necessary, quickly get the child's attention first, by saying, '*Ready*'.... to the last item. '*Now try these. Listen really carefully. Ready...*' A. **sad cat** gives (cad sat)	Instructions were very simple and may deviate from its original meaning. Instructions to the test administrator were not translated. The following are the translated instructions for the children: 'Sekarang kamu cuba ini. Sila dengarkan. Sedia...' A. **kopi ganti dengan /t/ jawapannya (topi)** [translation to English: *kopi* with a /t/ gives *topi* *kopi* – coffee *topi* – hat] The sentence is literally translated from the original PhAB (in the first column).

	However, there are some grammatical errors observed in the translation of "Now try these." It was translated as '*sekarang kamu cuba ini*'. According to the Malay language sentence structure, it should read '*sekarang kamu cuba yang lain*'. *ini* – It means 'this' in English at which, in this context, refers to a singular noun i.e. the test item. *yang lain* – It means 'the following items' in English.

2) Items

Original PhAB	Preliminary Modification
The subtests in the original PhAB: - Alliteration Test - Supplementary Alliteration Test - Naming Speed Test - Rhyme Test - Spoonerisms Test - Fluency Test - Non-word Test	The Supplementary Alliteration, Naming Speed, Fluency and Non-word tests were neither translated nor modified. Only the following tests were translated and/or modified to Malay: - Alliteration Test - Rhyme Test - Spoonerisms Test However, in the Alliteration and Rhyme tests, a few spelling mistakes were observed such as: ***Krusi*** should read ***kerusi*** (the letter 'e' is missing) ***Shukur*** should read ***syukur*** (the letter 'h' should be 'y') ***Seranga*** should read ***serangga*** (the correct word should have double 'g')

3) Record Forms

- The record forms were followed exactly from the original PhAB. No other modifications were made.
- For Alliteration, Rhyme and Spoonerisms Test, the English items were replaced with Malay.

4) Layout

- No modifications were made

Appendix 2: Permission from the PhAB author

RE: PhAB

Haji-Ismail, Nor
Sent: 07 January 2010 19:58
To: Richards, Andrew

Dear Andrew,
Thank you very much. This is great. I will start doing the plans now.

warmest regards,
Irlen

From: Richards, Andrew
Sent: 06 January 2010 11:34
To: n.frederickson@talk21.com
Cc: Haji-Ismail, Nor
Subject: RE: PhAB

Dear Norah,

This is great news, thank you. I have copied Irlen into this reply.

I hope you are not too inconvenienced by the snow. I was externally examining in Sheffield yesterday and count myself lucky to have got back just in advance of the snow.

with best wishes

Andrew

Andrew Richards
Programme Director: Educational, Child and Community Psychology
Graduate School of Education
University of Exeter
Heavitree Road
EXETER
EX1 2LU

From: n.frederickson@talk21.com [n.frederickson@talk21.com]
Sent: 05 January 2010 14:44
To: Richards, Andrew
Subject: Re: PhAB

Dear Andrew,
I would have no objection and am happy to take responsibility for agreeing on behalf of Rea and Uta also. However if there are plans to make the instrument commercially available she would need to discuss with the publisher also re copyright. I can't see there being problems as there are no plans to produce a revised/updated edition of PhAB and a Malay version is unlikely to be seen as a potential money spinner.
Best wishes,
Norah

From: "Richards, Andrew" <A.J.Richards@exeter.ac.uk>
To: "n.frederickson@ucl.ac.uk" <n.frederickson@ucl.ac.uk>
Cc: "Haji-Ismail, Nor" <nibh201@exeter.ac.uk>
Sent: Monday, 4 January, 2010 10:49:57
Subject: PhAB

Dear Norah,

Happy New Year.

One of the students here, Irlen, would like to standardize a Malay version of the PhAB in Brunei . She has collaborated with another psychologist in Brunei to produce a Malay version which closely follows the structure of the PhAB in English.

Would you have any objections to this, of course all necessary acknowledgements would be given?

If you have no objections, would it be necessary to approach Uta and Rea also, or as fist author are you able to agree on their behalf?

With all best wishes

Andrew

Andrew Richards
Chartered Educational Psychologist
Programme Director - Doctorate in Educational, Child and Community Psychology
University of Exeter
St Luke's Campus
Heavitree Road
EXETER
EX1 2LU

Registered with the Health Professionals Council (Ref PYL 23612)

Appendix 3: Description of each test (adapted from PhAB, Page 1 & 2)

Chapter 1

Introduction and general directions for administration

What is the Phonological Assessment Battery (PhAB)?

The Phonological Assessment Battery is designed to assess phonological processing. We define phonological processing broadly as the ability to process sounds in spoken language. Phonology is that part of language that concerns the sounds of words, rather than their meanings or grammatical structures. The theoretical rationale and research basis for the selection and construction of each type of test is described in Appendix 1. The types of tests which comprise the battery are outlined below:

- **The Alliteration Test** is designed to assess children's ability to isolate the initial sounds in single syllable words. On each trial they listen to three words and say which two of the three start with the same sound (e.g. ship, *fat*, *fox*). Those experiencing difficulties with this oral test can be given a supplementary **Alliteration Test with Pictures** in which pictures of the named objects are provided and the children can respond by pointing.
- **The Naming Speed Tests** are designed to assess speed of phonological production, involving retrieval of phonological coding at the whole word level. Two forms of the Naming Speed Test are provided. The Picture Naming Test uses line drawings of five common objects: a table, a door, a ball, a hat and a box. The Digit Naming Test uses numbers 1 to 9. In each case the child is shown a visual display of randomly presented items and asked to name them in sequence as quickly as they can. Two trials are provided with each type of stimulus.
- **The Rhyme Test** is designed to assess the ability to identify the rhyme in single syllable words (e.g. the 'ate' in 'gate, plate'). On each trial children listen to three words and say which two of the three end with the same sound (e.g. *made*, hide, *fade*).
- **The Spoonerisms Test** is designed to assess whether children can segment single syllable words and then *synthesize* the segments to provide new words or word combinations. The test consists of two parts. In the easier Part 1 the child is asked to replace the first sound of a word with a new sound (e.g. 'cot' with a /g/ makes 'got'). In Part 2 the child is asked to exchange the initial sounds of two words (e.g. 'sad cat' makes 'cad sat'). Each part is subject to a time limit of three minutes.
- **The Fluency Tests** are designed to assess retrieval of phonological information from long-term memory. The children are asked to say as many words of a particular type as they can in 30 seconds. There are three parts, each requiring a different type of word retrieval: first, by semantic category (e.g. names of animals), second, by alliteration (e.g. words beginning with /m/), and third by rhyme (e.g. words that rhyme with 'bat'). The first part, the semantic fluency test, is not a measure of phonological processing, but of semantic processing. It is administered to familiarize children with the task requirements and to provide comparison data for the interpretation of results.

- **The Non-Word Reading Test** is designed to assess the decoding of letter strings. When children read phonetically regular real words, they may draw on their phonological processing skills and knowledge of letter-sound relationships to decode the word, and/or they may draw on their sight vocabulary to recognize the word and/or they may draw on their spoken vocabulary for clues to the word's identity. However, these last two strategies, which are based on visual processing and meaning, cannot be used when reading non-words. This test taps the phonological processing involved in reading non-words. There are two parts: the first consists of 10 one-syllable items (e.g. 'tib') and the second of 10 two-syllable items (e.g. 'haplut').

How and why was the PhAB developed?

An extensive and convincing body of research links phonological processing with children's progress in basic literacy (see Appendix 1 for further details) and provides the basis for developing practical measures that can be used in schools to identify and help children with phonological difficulties.

A Research Seminar Group, consisting of practising educational psychologists, educational psychology trainers and leading academics, met at University College London from 1992 to 1994 to work on the development of a test of phonological processing. They devised and provided initial statistical data for a Research Edition of the Phonological Assessment Battery which was subsequently trialled by teachers and psychologists nationally. The trials led to further developments and adaptations which were incorporated into a revised battery of tests. These revised tests have now been administered to a representative national sample of children to provide the standardization data and the norms presented in this manual (see Appendix 2 for technical details).

It must be stressed at the outset that, although important, phonological processes are not exclusive in determining progress in literacy. Learning to read and write integrates many experiences and abilities. Comprehensive assessment requires investigation, over time, of the child's achievements and strategies in relation to the learning opportunities provided through the reading and writing curriculum. The Phonological Assessment Battery provides a systematic means for testing out and explaining some of the observations that teachers have made through the process of teaching and for establishing whether a child is experiencing significant phonological processing difficulties.

It must also be stressed that the Phonological Assessment Battery does not imply teaching methods that focus solely on phonics. Programmes based on comprehensive models of literacy (including phonological processing as one element) have been shown to produce better results than those addressing only a few components of the reading process. There would be little point in decoding text if understanding and enjoyment of the content were missing. Indeed, children who experience severe and persistent phonological difficulties are likely to require an emphasis on learning effective compensatory strategies which build on areas of relative strength such as the use of contextual cues. As illustrated in Chapter 3, the PhAB can help to inform this kind of individual education planning.

Who is the PhAB for?

This section offers guidance on who PhAB is intended to be used *by* and who it is intended to be used *with*.

PhAB is intended to be used by:

- Practitioners experienced in administering and interpreting psychometric and diagnostic educational tests. During the development of the battery, the tests have been used and

Appendix 4: MPhAB Record Form (Adapted from PhAB)

Phonological Assessment Battery (PhAB)

RECORD FORM

Norah Frederickson, Uta Frith, Rea Reason

			Year	Month	Day
Name:		Date tested:			
Address:		Date of Birth:			
		Age:			
		Sex:			
First language:		School:			
Tested by:		Year:			
Position:		Special Educational Needs STAGE:			

The PhAB Profile Grid

PhAB Test	Raw Score	Standardized Score	PROFILE 70 85 100 115 130
Alliteration Test			
Rhyme Test			
Spoonerisms Test			
Non-word Reading Test			
Naming Speed Test (Picture)			
Naming Speed Test (Digits)			
Fluency Test (Alliteration)			
Fluency Test (Rhyme)			
Supplementary Test Alliteration Test with Pictures			
Non-Phonological Test Fluency Test (Semantic)			
Number of Highlighted PhAB Scores			

Alliteration Test – Malay Version

Part 1 Practice Items

A	sopan	miskin	sabun	(s)
B	limau	masin	mesti	(m)
C	pasir	pisau	rambut	(p)

Part 1 Test Items

					Score (0 or 1)
1.	lari	kapal	kerbau	(k)	
2.	manis	bulan	meja	(m)	
3.	besi	nama	nenek	(n)	
4.	damai	dekat	pen	(d)	
5.	tin	susah	topi	(t)	

Part 1	(3 or more needed to continue)	**Total**	

Part 2 Practice Items

D	syukur	sambung	syurga	(sy)
E	parang	program	promosi	(pro)

Part 2 Test Items

					Score (0 or 1)
6.	khidmat	kuku	khas	(kh)	
7.	statik	surat	stapel	(st)	
8.	proaktif	prosedur	pesta	(pro)	
9.	nyanyi	nama	nyaris	(nya)	
10.	sanggul	syarat	syarikat	(sy)	

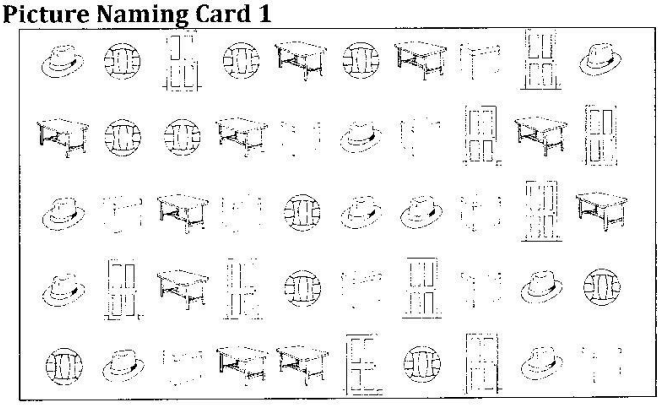
Part 2		**Total**	

Alliteration Test	(Part 1 + Part 2 : Out of 10)	**Total**	

Comments:

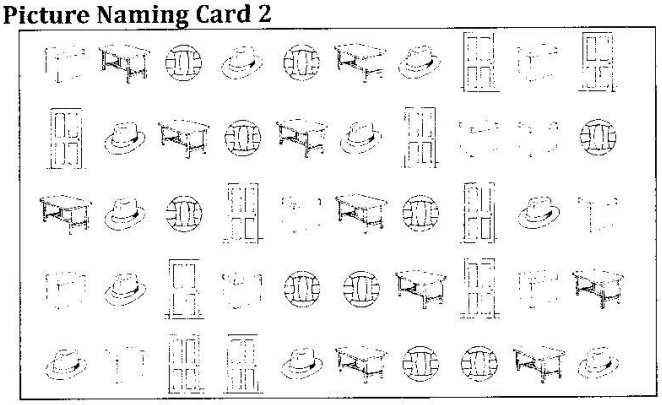
Naming Speed Test

Picture Naming Card 1



Time (to nearest second)

Picture Naming Card 2



Time (to nearest second)

PICTURE NAMING TOTAL (in seconds)= (Naming Card 1+2)	

Digit Naming

Digit Naming card 1

23929
54635
55852
91549
12856
85811
45932
48431
83659
28896

Time (to nearest second)

Digit Naming card 2

58869
29852
24651
54919
36849
49354
26892
12463
81845
29496

Time (to nearest second)

DIGITAL NAMING TOTAL (in seconds)= (Naming Card 1+2)	

Comments:
(Please note if more than two uncorrected errors are made on any card.)

Rhyme Test

Items Latihan

A	buku	ayam	duku	(uku)
B	pagi	lagi	jalan	(agi)
C	tulis	kopi	topi	(opi)

	Part 1	**Test Items**			**Score**(0 or 1)
1.	buat	epal	kuat	(uat)	
2.	dari	hari	ikan	(ari)	
3.	dua	hijau	tua	(ua)	
4.	mata	bata	orang	(ata)	
5.	suka	datang	buka	(uka)	
6.	nama	lama	pisang	(ama)	
7.	motor	kotor	rumah	(otor)	
8.	satu	malam	batu	(atu)	
9.	Isnin	sudah	mudah	(uda)	
10.	sila	kucing	bila	(ila)	
11.	makan	ikan	roti	(kan)	
12	gelas	mulut	kelas	(elas)	

Part 1	(9 or more needed to continue)	**Total**	

	Part 2	**Test Items**			**Score** (0 or 1)
13.	gaji	dalam	malam	(alam)	
14.	pinta	minta	tinggal	(inta)	
15.	ibu	rambut	sambut	(ambut)	
16.	sungai	bangga	perangai	(ngai)	
17.	tolong	boleh	kosong	(ong)	
18.	punya	pokok	tanya	(nya)	
19.	kuah	darah	buah	(wah)	
20.	hijau	muda	pulau	(au)	
21.	perang	usang	sarang	(rang)	

Part 2	**Total**	

Rhyme Test	(Part 1 + Part 2 : Out of 21)	**Total**	

Spoonerisms Test

Practice Items (Spoonerisms Test)

A	ibu	diganti dengan	/a/	menjadi	(abu)
B	buat	diganti dengan	/k/	menjadi	(kuat)
C	buku	diganti dengan	/d/	menjadi	(duku)

Part 1 Test Items

Time starts here ⏱

						Score 0 or 1
1.	kopi	diganti dengan	/t/	menjadi	(topi)	
2.	lama	diganti dengan	/r/	menjadi	(rama)	
3.	salam	diganti dengan	/d/	menjadi	(dalam)	
4.	pagi	diganti dengan	/l/	menjadi	(lagi)	
5.	motor	diganti dengan	/k/	menjadi	(kotor)	
6.	jam	diganti dengan	/p/	menjadi	(pam)	
7.	batu	diganti dengan	/s/	menjadi	(satu)	
8.	rambut	diganti dengan	/s/	menjadi	(sambut)	
9.	luka	diganti dengan	/b/	menjadi	(buka)	
10.	santai	diganti dengan	/b/	menjadi	(pantai)	

Time stops here ⏱

Part 1	**Total Score**	
	Total time taken	

Spoonerisms Test

Hentikan tugasan:
- skor **0** bagi tiga item berturut-turut
- 3 minit berlalu bermula dari Item pertama

X

Part 2 Practice Items

D	bapa	haus	menjadi	hapa	baus
E	minta	kopi	menjadi	kinta	mopi
F	keropok	pisang	menjadi	peropok	kisang

Part 2	**Test Items**

Time starts here

						Score 0, 1 or 2
1.	salam	pesta	menjadi	palam	sesta	
2.	buah	gugur	menjadi	guah	bugur	
3.	buat	lagi	menjadi	laut	bagi	
4.	roti	panas	menjadi	poti	ranas	
5.	buah	keras	menjadi	kuah	beras	
6.	zahir	batin	menjadi	bahir	zatin	
7.	nenek	tuah	menjadi	tenek	nuah	
8.	kasturi	ping	menjadi	pasturi	king	
9.	milo	ping	menjadi	pilo	ming	
10.	buku	tebal	menjadi	tuku	bebal	

Time stops here

Part 2	**Total**	
	Total Time Taken	

Spoonerisms Test (Part 1 + Part 2: out of 30)	

Fluency Test

SEMANTIC	ⓣ 30 saat diberikan bagi setiap item.
Item latihan. **Barang-barang yang terdapat di sekolah**	
1. **nama makanan**	S1: Score
2. **binatang**	S2:Score
SEMANTIC FLUENCY TOTAL SCORE	

ALLITERATION	
Practice item. **/b/**	
1. **/l/**	S1: Score
2. **/k/**	S2:Score
ALLITERATION FLUENCY TOTAL SCORE	

RHYME	
Practice item. **Makan**	
1. **Lari**	S1: Score
2. **Parang**	S2:Score
RHYME FLUENCY TOTAL SCORE	

Non-Word Reading Test

Card 1 Practice items	* Start here *	
	Response	
A. Tib		
B. Lom		
C. Rad		

Card 2 One-syllable items	• Items 1-5, if child score **0**, discontinue • Overall Items 1-10, if child score only **4**, discontinue	
	Response	Score 0 or 1
1. pim		
2. gat		
3. fot		
4. lub		
5. hin		
6. chog		
7. trum		
8. pran		
9. nabe		
10. khomus		
Card 2 total		

Card 3 Two-syllable items		
	Response	Score 0 or 1
11. haplut		
12. yutmip		
13. musnga		
14. potfeg		
15. shendom		
16. kulnya		
17. syaking		
18. ropsat		
19. khidrot		
20. plutskir		
Card 3 total		

NON-WORD READING TEST TOTAL (Card 2 + Card 3: out of 20)	

Appendix 5: MPhAB Manual and Test Materials

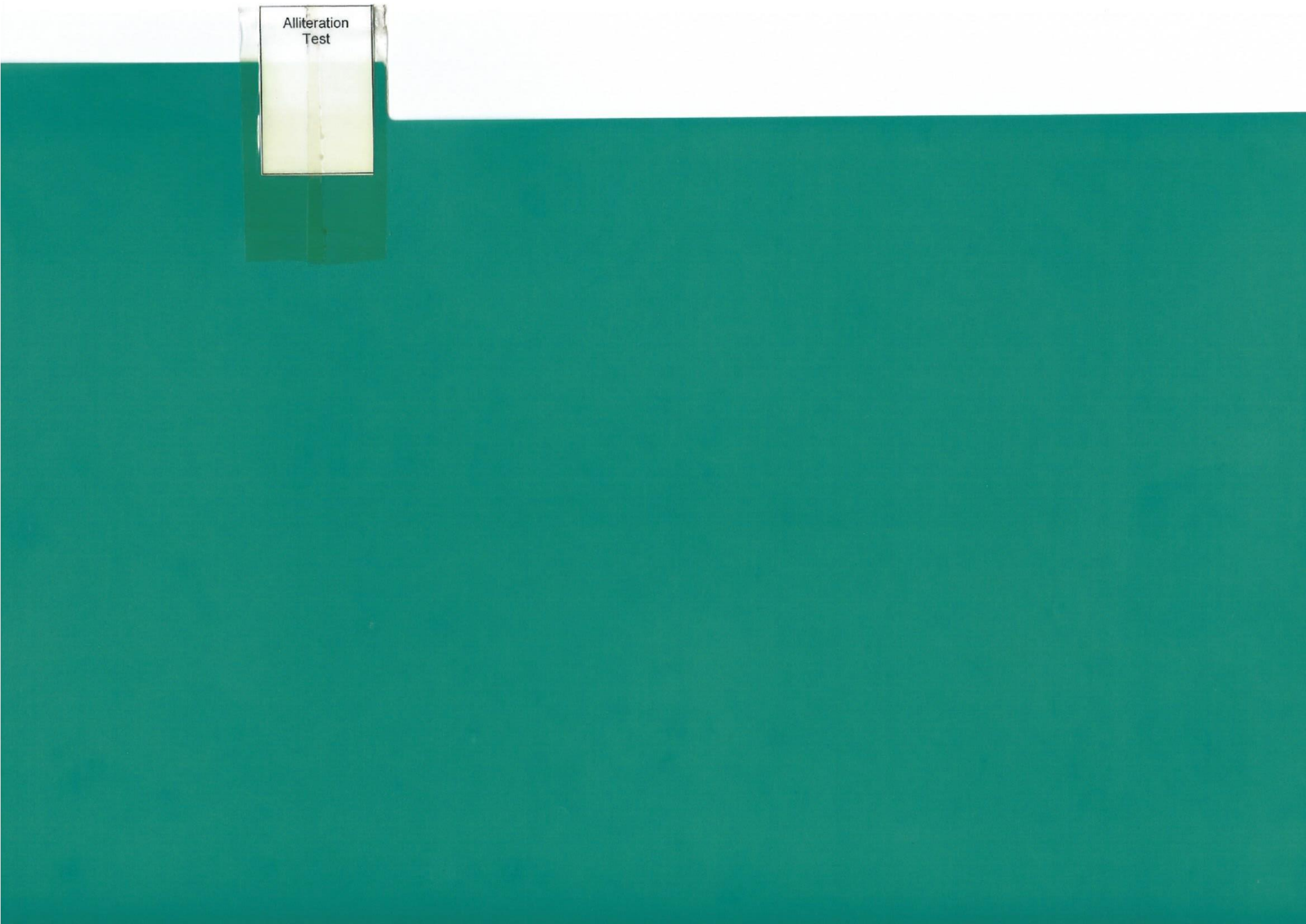
Phonological Assessment Battery

Malay Version

MANUAL AND TEST MATERIALS

Norah Frederickson
Uta Frith
Rea Reason

Modified by
Nor Irlenwati Haji Ismail


Alliteration
Test

Phonological Assessment Battery (Malay)

The Alliteration Test

Bahan digunakan:

- Borang rekod

Huraian ujian:

Setiap ujian percubaan, awda mesti membacakan TIGA perkataan kepada seorang murid. Kemudian murid itu akan menyebut dua perkataan yang sama bunyinya.

Ujian ini terbahagi kepada dua bahagian.

Bahagian I (mudah):	Perkataan yang bermula dengan satu konsonan
Bahagian II (sukar):	Murid dikehendaki untuk mengasingkan bunyi pertama dari permulaan (awal) konsonan.

Bahagian I: ***Item Latihan (Mudah)***

A.	sopan	miskin	sabun	(s)
B.	limau	masin	mesti	(m)
C.	pasir	pisau	rambut	(p)

Bahagian I: ***Item Ujian (Mudah)***

1.	lari	kapal	kerbau	(k)
2.	manis	bulan	meja	(m)
3.	besi	nama	nenek	(n)
4.	damai	dekat	pen	(d)
5.	tin	susah	topi	(t)

Bahagian II: ***Item Latihan (Sukar)***

D.	makan	petang	mesti	(m)
E.	kuda	baca	bulan	(b)

Bahagian II: ***Item Ujian (Sukar)***

6.	khidmat	kuku	khas	(kh)
7.	statik	surat	stapel	(st)
8.	proaktif	prosedur	pesta	(pro)
9.	nyanyi	nama	nyaris	(ny)
10.	syarat	syarikat	sanggul	(sy)

Susunan tugasan

Item Latihan

⇩

Item Ujian - Bahagian 1 (Mudah)

⇩

Item Ujian - Bahagian 2 (Sukar)

Arahan

Bahagian I: Item Latihan (Mudah)

Saya akan menyebut tiga perkataan

A. sopan miskin sabun

Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi sekali,

(Kekalkan bunyi awal perkataan) –

sssopan mmmiskin sssabun

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓ Jika jawapan murid betul:

Betul, sopan dan sabun bermula dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang sama bermula dengan sss.

sssopan bermula dengan /s/

dan

sssabun bermula dengan /s/

tetapi

mmmiskin tidak bermula dengan /s/, ia bermula dengan /m/

Oleh itu, sopan dan sabun bermula dengan bunyi yang sama.

Bahagian I: Item Latihan (Mudah)

Sekarang ada tiga lagi perkataan. Bersedia

B. limau masin mesti

Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi sekali,

(Kekalkan bunyi awal perkataan) –

llimau mmmasin mmmesti

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓Jika jawapan murid betul:

Betul, masin dan mesti bermula dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang sama bermula dengan mmm.

mmmasin bermula dengan /m/

dan

mmmesti bermula dengan /m/

tetapi

llimau tidak bermula dengan /m/, ia bermula dengan /l/

Oleh itu, masin dan mesti bermula dengan bunyi yang sama.

Bahagian I: Item Latihan (Mudah)

Sekarang cuba perkataan ini. Bersedia

C. pasir pisau rambut

Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi sekali,

(Kekalkan bunyi awal perkataan) –

pppasir pppisau rrrambut

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓Jika jawapan murid betul:

Betul, **pasir** dan **pisau** bermula dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang sama bermula dengan ppp.

pppasir bermula dengan /p/

dan

pppisau bermula dengan /p/

tetapi

rrrambut tidak bermula dengan /p/, ia bermula dengan /r/

Oleh itu, pasir dan pisau bermula dengan bunyi yang sama.

Bahagian I: ***Item Ujian (Mudah) 1-5***

Sekarang cuba perkataan ini. Dengarkan dengan baik dan sila sebut perkataan yang bermula dengan bunyi yang sama. Bersedia?

Arahan ini boleh dipendekkan seminima yang perlu untuk mengambil perhatian murid,

Perkataan selanjutnya. Bersedia

atau

Bersedia

1.	lari	kapal	kerbau	(k)
2.	manis	bulan	meja	(m)
3.	besi	nama	nenek	(n)
4.	damai	dekat	pen	(d)
5.	tin	susah	topi	(t)

Arahan Tambahan

** Jangan tekankan bunyi awal kata dalam item ujian. Sebut perkataan dalam nada datar dan kelajuan yang sama kira-kira satu saat bagi setiap perkataan. Jika murid terlebih dahulu memberi jawapan sebelum kesemua tiga perkataa disebut, katakan

Sila dengarkan terlebih dahulu...

(Ini adalah untuk memastikan murid menunggu untuk mendengar semua perkataan)

** Jangan betulkan kesalahan murid.

** Jika murid tersebut tidak memberi respon kepada item atau meminta salah satu atau semua perkataan untuk diulang, ketiga-tiga perkataan dapat diulangi **sekali** sahaja. Jika murid tersebut meminta ulangan lebih lanjut, anda perlu menjelaskan bahawa anda perlu untuk berpindah ke item seterusnya.

Saya hanya dapat mengulang sekali sahaja. Ingat, dengarkan dengan baik. Perkataan seterusnya. Bersedia…

atau

Cuba yang lain. Dengarkan dengan baik dan sebutkan perkataan yang sama bunyi nya. Sedia…

Bahagian II: ***Item Latihan (Sukar)***

Kita akan menyebut beberapa perkataan selanjutnya. Dengarkan dengan baik:

D. **syukur** **sambung** **syurga**

Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi sekali, (Beri tekanan bunyi awal perkataan) –

syukur **sambung** **syurga**

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓ Jika jawapan murid betul:

"Betul, syukur dan syurga bermula dengan bunyi yang sama"

✗ Jika jawapan murid salah:

Perkataan yang bermula dengan bunyi yang sama adalah syukur (beri tekanan /sy/) dan syurga (beri tekanan /sy/, tetapi sambung tidak bermula dengan /sy/. Oleh itu, bunyi awal yang sama adalah syukur dan syurga.

Bahagian II: ***Item Latihan (Sukar)***

Sekarang ada tiga lagi perkataan. Bersedia

E. **parang** **program** **promosi**

Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi sekali, (Beri tekanan bunyi awal perkataan) –

parang **program** **promosi**

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓ Jika jawapan murid betul:

"Betul, program dan promosi bermula dengan bunyi yang sama"

✗ Jika jawapan murid salah:

Perkataan yang bermula dengan bunyi yang sama adalah program (beri tekanan /pr/) dan promosi (beri tekanan /pr/, tetapi parang tidak bermula dengan /pr/. Oleh itu, bunyi awal yang sama adalah program dan promosi.

Bahagian II: : Item Ujian (Sukar) 6-10

Sekarang cuba perkataan ini. Dengarkan dengan baik dan sila sebut perkataan yang bermula dengan bunyi yang sama. Bersedia?

Arahan ini boleh dipendekkan seminima yang perlu untuk mengambil perhatian murid,

Perkataan selanjutnya. Bersedia

atau

Bersedia

6.	khidmat	kuku	khas	(kh)
7.	statik	surat	stapel	(st)
8.	proaktif	prosedur	pesta	(pro)
9.	nyanyi	nama	nyaris	(ny)
10.	syarat	syarikat	sanggul	(sy)

Arahan Tambahan

** Jangan tekankan bunyi awal kata dalam item ujian. Sebut perkataan dalam nada datar dan kelajuan yang sama kira-kira satu saat bagi setiap perkataan. Jika murid terlebih dahulu memberi jawapan sebelum kesemua tiga perkataa disebut, katakan

Sila dengarkan terlebih dahulu…

(Ini adalah untuk memastikan murid menunggu untuk mendengar semua perkataan)

** Jangan betulkan kesalahan murid.

** Jika murid tersebut tidak memberi respon kepada item atau meminta salah satu atau semua perkataan untuk diulang, ketiga-tiga perkataan dapat diulangi **sekali** sahaja. Jika murid tersebut meminta ulangan lebih lanjut, anda perlu menjelaskan bahawa anda perlu untuk berpindah ke item seterusnya.

Saya hanya dapat mengulang sekali sahaja. Ingat, dengarkan dengan baik. Perkataan seterusnya. Bersedia...

atau

Cuba yang lain. Dengarkan dengan baik dan sebutkan perkataan yang sama bunyi nya. Sedia...

Supp.
Alliteration
Test

Supplementary Test:

The Alliteration Test with Pictures

Bahan digunakan:

- Borang rekod
- Gambar stimulus

Huraian ujian:

Setiap item terdapat tiga gambar. Awda hendaklah menamakan gambar sambil menunjukkannya kepada murid. Sebut tiga gambar tadi dan murid tersebut akan menunjukkan gambar yang sama bunyi (awal dan hujung perkataan)

Ujian ini terbahagi kepada 3 bahagian:

Bahagian 1 (mudah) : Perkataan yang bermula dengan satu konsonan

Bahagian 2 (sukar) : Murid dikehendaki untuk mengasingkan bunyi

& Bahagian 3 (sukar) pertama dari permulaan (awal) konsonan

Susunan tugasan

Item Latihan – Bahagian 1 (Mudah)

⇩

Item Ujian - Bahagian 1 (Mudah)

⇩

Item Latihan – Bahagian 2 (Sukar)

⇩

Item Ujian - Bahagian 2 (Sukar)

⇩

Item Ujian - Bahagian 3 (Sukar)

⇩

Item Ujian - Bahagian 3 (Sukar)

Arahan

Bahagian 1: Item Latihan (Mudah)

A.	pisang	pisau	kucing

Sila liat gambar ini, Gambar pertama ialah pisang, yang kedua ialah pisau dan kemudiannya kucing. Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi

sekali,

(Kekalkan bunyi awal perkataan)

pppisang **pppisau** **kkkucing**

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓ Jika jawapan murid betul:

Betul, pisang dan pisau bermula dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang sama bermula dengan pp.

pppisang bermula dengan /p/ dan pppisau bermula dengan /p/

tetapi kkkucing tidak bermula dengan /p/, ia bermula dengan /k/

Oleh itu, pisang dan pisau bermula dengan bunyi yang sama.

B.	Daun	Duit	Berus

Sila liat gambar ini, Gambar pertama ialah daun, yang kedua ialah duit dan kemudiannya berus. Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi

sekali,

(Kekalkan bunyi awal perkataan)

dddaun **ddduit** **bbberus**

Dua perkataan mana bermula dengan bunyi awal yang sama?

Bahagian I: Item Ujian (Mudah) 1-5

Maklumat Penting

- Mulakan dengan gambar dari kiri ke kanan (tunjuk dan sebut)
- Jangan tekankan bunyi awal perkataan
- Sebut perkataan dengan mendatar dan dengan kelajuan 1 saat bagi setiap perkataan
- Jangan betulkan kesalahan murid.

Jika murid memberi jawapan sebelum kesemua perkataan disebut, katakan kepada murid untuk mendengar terlebih dahulu. Katakan

Sila dengarkan terlebih dahulu...

(Ini adalah untuk memastikan murid menunggu untuk mendengar semua perkataan)

Jika murid tersebut tidak memberi respon kepada item atau meminta salah satu atau semua perkataan untuk diulang, ketiga-tiga perkataan dapat diulangi **sekali** sahaja. Jika murid tersebut meminta ulangan lebih lanjut, anda perlu menjelaskan bahawa anda perlu untuk berpindah ke item seterusnya.

Saya hanya dapat mengulang sekali sahaja. Ingat, dengarkan dengan baik. Perkataan seterusnya. Bersedia...

atau

Cuba yang lain. Dengarkan dengan baik dan sebutkan perkataan yang sama bunyi nya. Sedia...

Bahagian I: Item Ujian (Mudah) 1-5

1.	sikat	kapal	kerbau

Sekarang ada tiga lagi gambar iaitu sikat, kapal dan kerbau.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi Sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama – sikat, kapal, kerbau.

2.	basikal	meja	bulan

Ada tiga lagi gambar iaitu basikal, meja, bulan.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi Sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama - basikal, meja, bulan.

Atau sebutkan sahaja:

Gambar mana bermula dengan bunyi yang sama

3.	mangkuk	matahari	ikan

Gambar di sini adalah mangkuk, matahari, ikan.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi Sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama - mangkuk, matahari, ikan.

Atau sebutkan sahaja:

Gambar mana bermula dengan bunyi yang sama

4.	**payung**	**daun**	**pokok**

Sekarang ada tiga lagi gambar iaitu payung, daun, pokok.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi Sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama – payung, daun, pokok.

5.	**tin**	**beg**	**topi**

Ada tiga lagi gambar iaitu tin, beg, topi.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi Sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama - tin, beg, topi.

Atau sebutkan sahaja:

Gambar mana bermula dengan bunyi yang sama

Bahagian 2: Item Latihan (Sukar)

D.	**sterika**	**stering**	**serangga**

Sila liat gambar ini, sterika, stering, serangga. Dua perkataan tadi bermula dengan bunyi yang sama. Dengarkan lagi

sekali,

(Kekalkan bunyi awal perkataan)

'st'erika **'st'ering** **ssserangga**

Dua perkataan mana bermula dengan bunyi awal yang sama?

✓Jika jawapan murid betul:

Betul, sterika dan stering bermula dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang sama bermula dengan st.

sterika bermula dengan /st/ dan stering bermula dengan /st/

tetapi ssserangga tidak bermula dengan /st/, ia bermula dengan /s/

Oleh itu, sterika dan stering bermula dengan bunyi yang sama.

Bahagian 2: ***Item Ujian (Sukar) 6-7***

6.	**sabun**	**stroberi**	**stokin**

Ada tiga lagi gambar: sabun, stroberi, stokin.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama - sabun, stroberi, stokin.

Atau sebutkan sahaja:

Gambar mana bermula dengan bunyi yang sama

7.	**nyamuk**	**nangka**	**nyonya**

Ada tiga lagi gambar: nyamuk, nangka, nyonya.

Tunjuk dan sebut gambar

Dua perkataan ini bermula dengan bunyi yang sama. Dengarkan lagi sekali dan sila tunjukkan gambar yang bermula dengan bunyi awal yang sama - nyamuk, nangka, nyonya.

Atau sebutkan sahaja:

Gambar mana bermula dengan bunyi yang sama

Bahagian 3: Item Latihan (Sukar)

E.	**tangga**	**mangga**	**kereta**

Sila liat gambar ini, tangga, mangga, kereta. Dua perkataan tadi berakhir dengan bunyi yang sama.

Ingat, bunyi di hujung perkataan. Dengarkan lagi sekali,

Kekalkan bunyi awal perkataan.

tangga **mangga** **kereta**

Dua perkataan mana berakhir dengan bunyi yang sama?

✓Jika jawapan murid betul:

Betul, tangga dan mangga berakhir dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang hujungnya sama iaitu /ngga/.

Tangga berakhir dengan /ngga/ dan mangga berakhir dengan /ngga/

tetapi kereta tidak berakhir dengan /ngga/, ia berakhir dengan /ta/

Oleh itu, tangga dan mangga berakhir dengan bunyi yang sama.

F.	payung	burung	bulan

Sila liat gambar ini, payung, burung, bulan. Dua perkataan tadi berakhir dengan bunyi yang sama.

Ingat, bunyi di hujung perkataan. Dengarkan lagi sekali,

Kekalkan bunyi awal perkataan.

payung **burung** **bulan**

Dua perkataan mana berakhir dengan bunyi yang sama?

✓Jika jawapan murid betul:

Betul, payung dan burung berakhir dengan bunyi yang sama

✗ Jika jawapan murid salah:

Dengarkan dengan baik, perkataan yang hujungnya sama iaitu /ung/.

Payung berakhir dengan /ung/ dan burung berakhir dengan /ung/

tetapi bulan tidak berakhir dengan /ung/, ia berakhir dengan /lan/

Oleh itu, payung dan burung berakhir dengan bunyi yang sama.

** **Gunakan bunyi 'di hujung'**

Bahagian 3: ***Item Ujian (Sukar) 8-10***

8.	**tuala**	**bunga**	**telinga**

Ada tiga lagi gambar: tuala, bunga, telinga

Tunjuk dan sebut gambar

Dua perkataan ini berakhir dengan bunyi yang sama. Dengarkan lagi sekali dan sila tunjukkan gambar yang berakhir dengan bunyi yang sama – tuala, bunga, telinga.

Atau sebutkan sahaja:

Gambar mana berakhir dengan bunyi yang sama

9.	**stesyen**	**televisyen**	**surat**

Ada tiga lagi gambar: stesyen, televisyen, surat

Tunjuk dan sebut gambar

Dua perkataan ini berakhir dengan bunyi yang sama. Dengarkan lagi sekali dan sila tunjukkan gambar yang berakhir dengan bunyi yang sama – stesyen, televisyen, surat

Atau sebutkan sahaja:

Gambar mana berakhir dengan bunyi yang sama

10.	**gunting**	**timun**	**stering**

Ada tiga lagi gambar: gunting, timun, stering

Tunjuk dan sebut gambar

Dua perkataan ini berakhir dengan bunyi yang sama. Dengarkan lagi sekali dan sila tunjukkan gambar yang berakhir dengan bunyi yang sama – gunting, timun, stering

Atau sebutkan sahaja:

Gambar mana berakhir dengan bunyi yang sama.

Naming
Speed Test

The Naming Speed Test

Bahan digunakan:

- Borang rekod
- *Stop watch*
- *Six Naming Cards*

Huraian ujian:

Ujian ini terbahagi kepada dua tugasan: *picture naming* dan *digit naming*. Setiap tugasan, murid tersebut dikehendaki untuk menamakan 50 gambar objek atau digit dan menamakannya dengan secepat mungkin.

Hentikan tugasan

- Jika murid tersebut tidak dapat menamakan kesemua gambar objek pada *Picture Familiarisation Card* walaupun setelah dijelaskan. Dalam keadaan ini, kedua-dua *Picture Naming Cards* tidak boleh diberikan.
- Jika murid tersebut tidak dapat menamakan kesemua nombor pada *Digit Familiarisation Card* walaupun setelah dijelaskan. Dalam keadaan ini, kedua-dua *Digit Naming Cards* tidak boleh diberikan.

Susunan tugasan

Picture Familiarisation Card (Latihan)

⇩

Picture Naming Card 1

⇩

Picture Naming Card 2

⇩

Digit Familiarisation Card (Latihan)

⇩

Digit Naming Card 1

⇩

Digit Naming Card 2

Picture Familiarisation Card

Lihatkan *Picture Familiarisation Card* kepada murid.

Baca arahan dibawah. Sila tunjuk kepada gambar objek sambil menamakannya.

Saya mahu kamu menamakan gambar yang tertera di sini dengan secepat mungkin. Gunakan Bahasa Melayu sahaja.
Contohnya, gambar objek pertama adalah bola, yang kedua adalah topi, yang ketiga adalah pintu dan seterusnya meja dan kemudiannya kotak.
Sekarang kamu hendaklah menamakan objek di sini dengan secepat mungkin.

Sila sediakan Picture Naming Card 1

Picture Naming Card 1

Sila lihatkan halaman *Picture Naming Card 1* kepada murid dan baca arahan dibawah.

Saya mahu kamu namakan gambar yang tertera di sini bermula dari sebelah kiri ke kanan (sambil menunjukkan baris dan pergerakkan dari kiri ke kanan)

Jangan berhenti di antara barisan. Namakan kesemua gambar objek dengan secepat mungkin dan saya akan gunakan *stop watch* untuk mengira masa kamu.

Gunakan Bahasa Melayu sahaja.

Cuba sedaya upaya untuk tidak membuat kesalahan. Jika kamu membuat salah, kamu bolehlah membuat pembetulan tetapi buat dengan secepatnya.

Kamu ada soalan?

Ingat, namakan gambar objek dengan secepat mungkin. Kamu boleh bermula apabila saya berkata "Mula"

(Berhenti sebentar selama 2 saat sebelum meneruskan tugasan)

Sedia...Mula

(Berhenti sebentar selama 1 saat diantara menyebut **Sedia** dan **Mula**)

Mulakan mengira masa bila menyebut **Sedia**

Berhenti mengira masa apabila murid tersebut menamakan gambar objek terakhir

Beri pujian kepada murid yang berusaha gigih.

Sila berikan waktu rehat selama 30 saat sebelum menunjukkan Picture Naming Card 2

Picture Naming Card 2

Sekarang kita akan melakukannya lagi menggunakan kad yang lain. Ingat, saya mahu kamu namakan gambar yang ada di sini dengan secepat mungkin dan cuba sedaya upaya untuk tidak membuat kesalahan.

(Berhenti sebentar selama kira-kira 2 saat sebelum meneruskan)

Sedia...Mula

(Berhenti sebentar selama 1 saat diantara menyebut **Sedia** dan **Mula**)

Mulakan mengira masa bila menyebut **Sedia**

Berhenti mengira masa apabila murid tersebut menamakan gambar objek terakhir.

Beri pujian kepada murid yang berusaha gigih.

Sila berikan waktu rehat selama 30 saat sebelum menunjukkan Digit Familiarization Card.

Digit Familiarization Card

Lihatkan *Digit Familiarisation Card* kepada murid.

Baca arahan di bawah. Sila tunjuk kepada barisan nombor sambil Membacakannya.

Saya mahu kamu membaca nombor yang ada di sini dengan secepat mungkin dan gunakan Bahasa Melayu sahaja.
Contohnya, nombor pertama ialah tiga, sekarang kamu baca nombor yang lain mengikut barisan, dengan secepat mungkin.

Beri pujian kepada murid yang berusaha gigih.

Bersedia untuk memulakan Digit Naming Card 1

Digit Naming Card 1

Saya mahu kamu baca nombor yang ada di sini dengan secepat mungkin. Baca setiap nombor berasingan. Contohnya, nombor pertama ialah dua, nombor seterusnya ialah tiga dan selanjutnya.

(sambil menunjukkan nombor tersebut)

Baca dari kiri ke kanan

(sambil menunjukkan baris dan pergerakkan dari kiri ke kanan)

Jangan berhenti di antara barisan nombor.

(selepas itu, tunjuk ke tiga kumpulan nombor pertama)

Baca semua nombor tanpa berhenti. Baca dengan secepat mungkin dan saya akan gunakan *stop watch* untuk mengira masa kamu.
Cuba sedaya upaya untuk tidak membuat kesalahan. Jika kamu membuat salah, kamu bolehlah membuat pembetulan tetapi buat dengan secepatnya.

Kamu ada soalan?

Ingat, baca nombor dengan secepat mungkin dan gunakan Bahasa Melayu sahaja. Kamu boleh bermula

apabila saya berkata "Mula"

(Berhenti sebentar selama 2 saat sebelum meneruskan tugasan)

Sedia...Mula

(Berhenti sebentar selama 1 saat diantara menyebut **Sedia** dan **Mula**)

Mulakan mengira masa bila menyebut **Mula**

Berhenti mengira masa apabila murid tersebut menamakan gambar objek Terakhir. Beri pujian kepada murid yang berusaha gigih.

Sila berikan waktu rehat selama 30 saat sebelum menunjukkan Digit Naming Card 2

Digit Naming Card 2

Sekarang kita akan melakukannya lagi menggunakan nombor yang lain. Ingat, saya mahu kamu namakan nombor yang ada di sini dengan secepat mungkin dan cuba sedaya upaya untuk tidak membuat kesalahan. Gunakan Bahasa Melayu sahaja.

(Berhenti sebentar selama kira-kira 2 saat sebelum meneruskan)

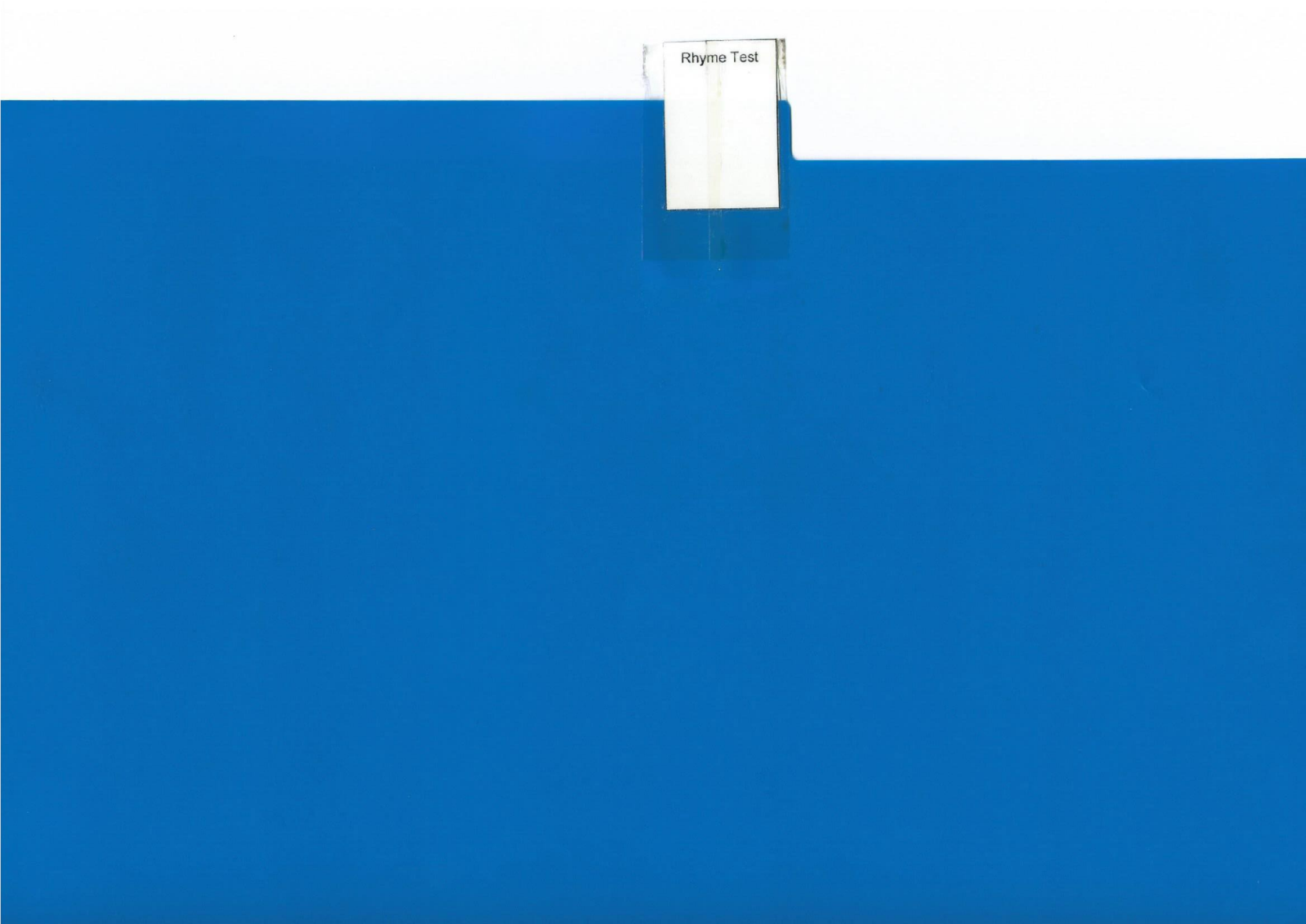
Sedia...Mula

(Berhenti sebentar selama 1 saat diantara menyebut **Sedia** dan **Mula**)

Mulakan mengira masa bila menyebut **Sedia**

Berhenti mengira masa apabila murid tersebut menamakan gambar objek terakhir

Beri pujian kepada murid yang berusaha gigih.


Rhyme Test

The Rhyme Test

Bahan digunakan:

- Borang rekod

Huraian ujian:

Tiga patah perkataan akan dibacakan kepada murid. Murid tersebut akan membaca dengan lantang dua perkataan yang sama bunyi penghujungnya (rima).

Ujian ini mengandungi 3 ujian latihan, 12 ujian item yang mudah (Bahagian 1) dan 9 ujian item yang sukar (Bahagian 2)

Hentikan tugasan

- Semua murid dikehendaki memulakan tugasan dengan ujian latihan dan disambung dengan Bahagian 1
- Jika murid tersebut gagal untuk membaca Item 1-4 (dalam Bahagian 1), sila hentikan The Rhyme Test dan berikan skor 0. Tetapi, jika murid tersebut berjaya membaca Item 1-4, teruskan tugasan Bahagian 1 selebihnya.
- Jika murid tersebut mendapat skor 8 atau kurang dalam Bahagian 1, hentikan tugasan. Tetapi, jika murid tersebut berjaya mendapat skor 9 atau lebih, teruskan tugasan Bahagian 2.

Susunan tugasan

Item Latihan

⇩

Item Ujian - Bahagian 1

⇩

Item Ujian - Bahagian 2

Arahan

Item Latihan

Saya akan menyebut tiga perkataan dan saya mahu kamu sebut dua perkataan yang sama bunyi di hujungnya. Tugasan tadi kita menggunakan di awal perkataan, sekarang di hujung. Dengarkan

A. **buku** **ayam** **duku**

Dua perkataan yang mana berakhir dengan bunyi yang sama?

✓ Jika jawapan murid betul:

"Betul, buku dan duku berakhir dengan bunyi yang sama"

✗ Jika jawapan murid salah:

"Dengarkan dengan baik, buku dan duku berakhir dengan bunyi yang sama iaitu /uku/, tetapi ayam berakhir dengan bunyi yang lain. Oleh itu, jawapannya ialah buku dan duku. Keduanya berakhir dengan bunyi yang sama.

Item Latihan B

Sekarang cuba perkataan ini. Dengarkan dengan baik dan sila saya mahu kamu sebutkan dua perkataan yang sama bunyi di hujungnya

B. **pagi** **lagi** **jalan**

✓Jika jawapan murid betul:

"Betul, pagi dan lagi berakhir dengan bunyi yang sama"

✗ Jika jawapan murid salah:

"Dengarkan dengan baik, pagi dan lagi berakhir dengan bunyi yang sama iaitu /agi/, tetapi jalan berakhir dengan bunyi /alan/.
Oleh itu, jawapannya ialah pagi dan lagi. Keduanya berakhir dengan bunyi yang sama.

Item Latihan C

Sekarang cuba perkataan ini. Dengarkan dan sebut dua perkataan yang sama bunyi di hujungnya

C. **tulis** **kopi** **topi**

✓Jika jawapan murid betul:

"Betul, kopi dan topi berakhir dengan bunyi yang sama"

✗ Jika jawapan murid salah:

"Kali ini, kopi dan topi berakhir dengan bunyi yang sama iaitu /opi/,
Oleh itu, jawapannya ialah kopi dan topi.

Bahagian I: Item Ujian (Mudah) 1-12

Sekarang cuba perkataan ini. Dengarkan dengan baik dan sila sebut perkataan yang hujung bunyinya sama. Bersedia?

Arahan ini boleh dipendekkan seminima yang perlu untuk mengambil perhatian murid,

Perkataan selanjutnya. Bersedia

atau

Bersedia

Arahan Tambahan

** Jangan tekankan bunyi penghujung kata dalam item ujian. Sebut perkataan dalam nada datar dan kelajuan yang sama kira-kira satu saat bagi setiap perkataan. Jika murid terlebih dahulu memberi jawapan sebelum kesemua tiga perkataa disebut, katakan

Sila dengarkan terlebih dahulu...

(Ini adalah untuk memastikan murid menunggu untuk mendengar semua perkataan)

** Jika murid tersebut tidak memberi respon kepada item atau meminta salah satu atau semua perkataan untuk diulang, ketiga-tiga perkataan dapat diulangi **sekali** sahaja. Jika murid tersebut meminta ulangan lebih lanjut, anda perlu menjelaskan bahawa anda perlu untuk berpindah ke item seterusnya.

Saya hanya dapat mengulang sekali sahaja. Ingat, dengarkan dengan baik. Perkataan seterusnya. Bersedia...

atau

Cuba yang lain. Dengarkan dengan baik dan sebutkan perkataan yang sama bunyi nya. Sedia…

1.	buat	epal	kuat	(uat)
2.	dari	hari	ikan	(ari)
3.	dua	hijau	tua	(ua)
4.	mata	bata	orang	(ata)
5.	datang	suka	buka	(uka)
6.	nama	lama	pisang	(ama)
7.	motor	kotor	rumah	(otor)
8.	satu	malam	batu	(atu)
9.	isnin	sudah	mudah	(udah)
10.	sila	kucing	bila	(ila)
11.	makan	ikan	roti	(kan)
12.	gelas	mulut	kelas	(elas)

Bahagian 2: Item Ujian (Sukar) 13-21

Ulangi arahan ini jika perlu.

Sekarang cuba perkataan ini. Dengarkan dengan baik dan sila sebut perkataan yang hujung bunyinya sama. Bersedia?

Arahan ini boleh dipendekkan seminima yang perlu untuk mengambil perhatian murid,

Perkataan selanjutnya. Bersedia

atau

Bersedia

13.	gaji	dalam	malam	(alam)
14.	pinta	minta	tinggal	(inta)
15.	ibu	rambut	sambut	(ambut)
16.	sungai	bangga	perangai	(ngai)
17.	tolong	boleh	kosong	(ong)
18.	punya	pokok	tanya	(nya)
19.	kuah	darah	buah	(wah)
20.	hijau	muda	pulau	(au)
21.	perang	usang	arang	(rang)

Spoonerisms
Test

The Spoonerisms Test

Bahan digunakan:

- Borang rekod
- Stop watch

Huraian ujian:

Ujian ini terbahagi kepada 2 ujian:-

Bahagian 1 adalah semi-spoonerisms di mana murid tersebut dikehendaki untuk menggantikan bunyi pertama perkataan dengan bunyi yang baru. Contohnya **'ibu'** diganti dengan ***/a/*** menjadi **'abu'.**

Bahagian 2 adalah full-spoonerisms di mana murid dikehendaki untuk menukar bunyi awal dalam dua kata perkataan.

Contohnya **'bapa haus'** menjadi **'hapa baus'.**

Setiap bahagian dikenakan had masa selama tiga minit

Mulakan dan hentikan tugasan

- Semua murid dikehendaki memulakan tugasan dengan Bahagian 1. Murid yang berumur dibawah 7 tahun TIDAK dikehendaki untuk membuat tugasan Bahagian 2. Murid berumur 7 tahun ke atas mesti di berikan Bahagian 1 dan 2 dengan syarat murid tersebut mendapat skor pada Bahagian 1.

- Tugasan hendaklah dihentikan:

a) setelah mendapat skor **0** tiga item berturut-turut. (Katakan: **"Tugasan ini semakin susah, kita akan berhenti sekarang. Terima kasih kerana mencuba dengan baik"**)

b) setelah 3 minit berlalu bermula dari Item pertama (Katakan: **"Kamu melakukan tugasan ini dengan tekun sekali. Ada baiknya kita mencuba yang lain"**)

Merekod & menskor

Tulis di atas Borang rekod kesemua respon yang diberikan.

Bahagian 1:

Skor: 1 markah bagi jawapan yang betul dan 0 bagi jawapan yang salah.

Skor maksimum: 10

Bahagian 2:

Murid dikehendaki untuk menghasilkan **dua** perkataan bagi setiap item.

Bagi setiap item, markah akan diberikan bagi setiap perkataan yang betul.

2 markah diberikan bagi dua perkataan yang betul dan akan diberikan dalam urutan apapun.

Contohnya **'bapa haus'** menjadi **'hapa baus'.**

Jika respon murid:

'**hapa baus**', 2 markah diberikan

'**baus hapa**', 2 markah diberikan

'**hapa'** sahaja, 1 markah diberikan

'baus' sahaja, 1 markah diberikan

'**haba baus',** atau **'hapa paus',** 1 markah sahaja diberikan

Skor maksimum: 20

Arahan

- Setiap perkataan hendaklah disebut dan jangan biarkan murid melihat perkataan yang ditulis atau dicetak.
- Bunyi abjad mesti lah digunakan sepenuhnya, bukannya nama abjad
- Contohnya: simbol /f/ adalah untuk bunyi abjad, BUKANNYA nama abjad (iaitu **ef**)

Susunan tugasan

Item Latihan – Bahagian 1

⇩

Item Ujian - Bahagian 1 (1-10)

⇩

Item Latihan – Bahagian 2

⇩

Item Ujian - Bahagian 2 (1-10)

Arahan

Item Latihan (Bahagian 1)

A.	**ibu** diganti dengan **/a/** menjadi **abu**

Kita akan bermain aktiviti bunyi-bunyi perkataan. Dengarkan – ibu diganti dengan /a/ menjadi abu.

Buang bunyi /i/, gantikan dengan bunyi /a/ jadi apa?

(Berikan dorongan kepada murid untuk menjawabnya atau menyebutnya bersama kamu)

.../a/.../a/...abu

(Berikan pujian pada usaha murid)

B.	**buat** diganti dengan **/k/** menjadi **kuat**

OK, kita akan mencuba yang lain. Buat diganti dengan /k/ menjadi ...

(Berikan dorongan kepada murid untuk **menjawabnya**)

✓ Jika jawapan murid betul:

Berikan pujian pada usaha murid dan teruskan ke item latihan C.

✗ Jika jawapan murid salah atau murid tidak memberikan jawapan:

'Buat' dengan /b/ menjadi ... /b/... Buat.

Buang bunyi /b/ gantikan dengan bunyi /k/.

Buang /b/ gantikan /k/ menjadi ... /k/ ... Kuat

(Berikan pujian pada usaha murid)

C.	**buku** diganti dengan **/d/** menjadi **duku**

OK, kita akan mencuba yang lain. Buku diganti dengan /d/ menjadi .....

(Berikan dorongan kepada murid untuk **menjawabnya**)

✓ Jika jawapan murid betul:

Berikan pujian pada usaha murid dan teruskan ke item Ujian.

✗ Jika jawapan murid salah atau murid tidak memberikan jawapan:

Buang bunyi /b/ dalam buku dan masukkan /d/, jadi

'Buku' diganti dengan /d/ menjadi ...

(Berikan pujian pada usaha murid)

... /d/... /d/ ... duku. Buku... Duku. Buku diganti dengan /d/ menjadi Duku.

(Berikan pujian pada usaha murid dan teruskan ke Ujian latihan

Bahagian 1 Ujian item 1-10

Mulakan mengira masa apabila menyebut perkataan pertama.

Setelah murid tersebut memberikan jawapan. Samada betul atau salah, teruskan dengan memberikan item yang lain.

Jika perlu, katakan '**Bersedia**' (untuk mengambil perhatian murid)

Jika murid tidak memberikan apa apa jawapan setelah 20 saat berlalu, buat cadangan untuk meneruskan ke item selanjutnya. Katakan:

Macam mana kalau kita cuba yang lain?

Soalan hanya boleh diulangi SEKALI sahaja. Jika murid inginkan lebih banyak pengulangan, terangkan bahawa anda akan meneruskan dengan item yang lain.

Katakan:

Saya hanya boleh mengulangi sekali sahaja. Ingat..Dengarkan dengan baik. Ini adalah yang berikutnya. Bersedia...

Berhenti mengira masa apabila murid sudah menjawab item terakhir.

Mula

'Sekarang cuba yang lain. Dengarkan dengan baik. Bersedia...'

1.	**kopi**	diganti dengan	**/t/**	menjadi	**(topi)**
2.	**lama**	diganti dengan	**/r/**	menjadi	**(rama)**
3.	**salam**	diganti dengan	**/d/**	menjadi	**(dalam)**
4.	**pagi**	diganti dengan	**/l/**	menjadi	**(lagi)**
5.	**motor**	diganti dengan	**/k/**	menjadi	**(kotor)**
6.	**jam**	diganti dengan	**/p/**	menjadi	**(pam)**
7.	**batu**	diganti dengan	**/s/**	menjadi	**(satu)**
8.	**rambut**	diganti dengan	**/s/**	menjadi	**(sambut)**
9.	**luka**	diganti dengan	**/b/**	menjadi	**(buka)**
10.	**santai**	diganti dengan	**/p/**	menjadi	**(pantai)**

Berikan pujian pada usaha murid

Item Latihan (Bahagian 2)

D.	**bapa haus**	menjadi	**(hapa baus)**

Sekarang adalah aktiviti yang lain. Saya akan menyebut dua perkataan. Dengarkan – bapa haus menjadi hapa baus.

/b/... bapa, /h/...haus.

Sambil menunjukkan pergerakkan tangan (tangan sebelah kiri 'bapa' dan sebelah kanan 'haus')

Katakan:

Tukarkan bunyi /b/ bapa dengan /h/ jadi hapa dan

Tukarkan bunyi /h/ haus dengan /b/ jadi baus

Lihatkan Spoonerisms Card 1 sambil menunjukkan perkataan yang disebut.

Kamu gantikan bunyi pertama /b/ dari perkataan pertama bapa

dengan

bunyi kedua /h/ dari perkataan kedua

Oleh itu, bapa haus menjadi ...

(Berikan dorongan kepada murid untuk **menjawabnya atau menyebutnya** bersama kamu)

"...hapa baus"

Di dalam aktiviti ini, jawapan tidak perlu perkataan yang benar – seperti hapa dan baus adalah dua perkataan yang tidak benar.

E.	**minta kopi**	menjadi	**(kinta mopi)**

Sekarang kita cuba lagi yang lain. Minta kopi menjadi…

(Berikan dorongan kepada murid untuk menjawabnya)

"…kinta mopi"

✓Jika jawapan murid betul:

Betul, jawapannya adalah kinta mopi.

✗ Jika jawapan murid salah:

Tunjukkan Spoonerisms Card 2 dan katakan:

Perhatikan dengan baik, (sambil menunjukkan perkataan yang disebut)

Kamu gantikan bunyi pertama /m/ dari perkataan pertama minta

dengan

bunyi kedua /k/ dari perkataan kedua kopi

Oleh itu, minta kopi menjadi …

(Berikan dorongan kepada murid untuk **menjawabnya**)

F.	**keropok pisang**	menjadi	**(peropok kisang)**

Sekarang kita cuba lagi yang lain. keropok pisang menjadi...

(Berikan dorongan kepada murid untuk **menjawabnya**)

✓ Jika jawapan murid betul:

Berikan pujian pada usaha murid dan teruskan ke item seterusnya.

✗ Jika jawapan murid salah atau tidak menjawapnya:

keropok pisang menjadi peropok kisang.

Bunyi awal keropok adalah /k/ dan bunyi awal pisang adalah /b/.

Kamu gantikan /k/ yang ada di keropok pada pisang menjadikannya kisang.

dan kamu gantikan /p/ yang ada di pisang pada keropok menjadikannya peropok.

Oleh itu keropok pisang menjadi...

(Berikan dorongan kepada murid untuk **menjawabnya** bersama-sama)

... **peropok kisang**

Berikan pujian pada usaha murid

Bahagian 2 Ujian item 1-10

Arahan

Mulakan mengira masa apabila menyebut perkataan pertama.

Setelah murid tersebut memberikan jawapan. Samada betul atau salah, teruskan dengan memberikan item yang lain.

Jika perlu, katakan '**Bersedia**' (untuk mengambil perhatian murid)

Jika murid tidak memberikan apa apa jawapan setelah 20 saat berlalu, buat cadangan untuk meneruskan ke item selanjutnya. Katakan:

Macam mana kalau kita cuba yang lain?

Soalan hanya boleh diulangi SEKALI sahaja. Jika murid inginkan lebih banyak pengulangan, terangkan bahawa anda akan meneruskan dengan item yang lain.

Katakan:

Saya hanya boleh mengulangi sekali sahaja. Ingat..Dengarkan dengan baik. Ini adalah yang berikutnya. Bersedia...

Berhenti mengira masa apabila murid sudah menjawab item terakhir.

Mula

'Sekarang cuba yang lain. Dengarkan dengan baik. Bersedia...'

1.	**salam pesta**	menjadi	**palam sesta**
2.	**buah gugur**	menjadi	**guah bugur**
3.	**buat lagi**	menjadi	**luat bagi**
4.	**roti panas**	menjadi	**poti ranas**
5.	**buah keras**	menjadi	**kuah beras**
6.	**zahir batin**	menjadi	**bahir zatin**
7.	**nenek tuah**	menjadi	**tenek nuah**
8.	**kasturi ping**	menjadi	**pasturi king**
9.	**milo ping**	menjadi	**pilo ming**
10.	**buku tebal**	menjadi	**tuku bebal**

Berikan pujian pada usaha murid

The Fluency Test

Bahan digunakan:

- Borang rekod
- Stop watch (30 saat diberikan bagi setiap item)

Susunan tugasan

Item Latihan Semantic

⇩

Item Ujian Semantic

⇩

Item Latihan Alliteration

⇩

Item Ujian Alliteration

⇩

Item Latihan Rhyme

⇩

Item Ujian Rhyme

Item Latihan Semantic

Barang-barang yang terdapat di sekolah

Di dalam ujian ini, saya akan menyuruh kamu memberi sebanyak mungkin beberapa perkataan dalam masa yang singkat. Apabila saya berkata "mula", kamu hendaklah memberikan saya nama nama barang yang terdapat di sekolah kamu dengan sebanyak mungkin.

(Jangan beritahu jumlah kiraan masa yang diperlukan)

Jangan berhenti selagi saya belum berkata "berhenti". Ingat..namakan barang-

barang yang terdapat di sekolah kamu, Bersedia... 'mula'

Mulakan mengira masa apabila menyebut perkataan 'mula'

Berhenti mengira masa apabila tempoh 30 saat lupus.

Berikan dorongan apabila murid tidak memberikan jawapan selepas beberapa saat.

Item Ujian Semantic

1. nama makanan

Sekarang kamu hendaklah memberikan sebanyak yang boleh kamu fikirkan nama makanan dengan secepat mungkin. Bersedia untuk menamakan nama nama makanan yang boleh kita makan, mulai ...sekarang.

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus. Berikan pujian pada usaha murid dan teruskan ke item 2

2. binatang

Sekarang kamu hendaklah memberikan sebanyak yang boleh kamu fikirkan nama binatang dengan secepat mungkin. Bersedia untuk menamakan nama nama binatang, mulai ...sekarang.

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus. Berikan pujian pada usaha murid dan teruskan ke item 2

Item Latihan Alliteration

Peringatan: Bunyi abjad mesti lah digunakan sepenuhnya, bukannya nama abjad. Contohnya: simbol /f/ adalah untuk bunyi abjad, BUKANNYA nama abjad (iaitu **ef**)

1. /b/

Sekarang kita akan beralih ke aktiviti yang lain. Kamu akan memberikan perkataan yang bermula dengan bunyi yang sama dengan sebanyak yang mungkin dan pada masa yang singkat.
Kita akan membuat latihan terlebih dahulu. Bolehkah kamu beritahu saya perkataan yang bermula dengan /b/ mulai ... sekarang.
(Jangan beritahu kiraan masa yang diperlukan)

Mulakan mengira masa apabila menyebut perkataan 'sekarang'
Berhenti mengira masa apabila tempoh 30 saat lupus.

Apabila murid tidak memberikan jawapan selepas beberapa saat, berikan dorongan "Baju, bola, biskut, beruang – barang-barang ini tidak semestinya yang kamu nampak sekarang, kamu boleh memberikan apa saja perkataan yang bermula dengan bunyi **/b/**.

✗ Jika jawapan murid salah, terangkan mengapa hal ini tidak betul:
'Kita tidak boleh menamakan X (sebut perkataan yang salah) sebab X tidak bermula dengan bunyi **/b/**. X bermula dengan bunyi /x/ (bunyi abjad). Y (sebut perkataan yang betul) boleh digunakan sebab ia bermula dengan bunyi **/b/**, **/b/**... **/b/**... Y.

Item Ujian Alliteration

1. /l/

Sekarang namakan beberapa perkataan dengan sebanyak yang mungkin yang bermula dengan bunyi /l/. Besedia untuk memberikan apa saja perkataan yang bermula dengan /l/ mulai... sekarang

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus. Berikan pujian pada usaha murid dan teruskan ke item 2

2. /k/

'Sekarang namakan beberapa perkataan dengan sebanyak yang mungkin yang bermula dengan bunyi **/k/**. Besedia untuk memberikan apa saja perkataan yang bermula dengan **/k/** mulai... sekarang'

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus. Berikan pujian pada usaha murid dan teruskan ke item seterusnya.

Item Latihan Rhyme

Sekarang kita akan beralih ke aktiviti yang lain iaitu perkataan yang sama bunyi hujungnya seperti:

satu sama bunyi hujungnya dengan batu,
dua sama bunyi hujungnya dengan gua,
Perkataan seterusnya,

tiga sama bunyi hujungnya dengan saga
empat sama bunyi hujungnya dengan lompat, tepat, sempat, rapat

Berikan dorongan kepada murid untuk menyebut apa sahaja perkataan yang sama bunyi hujungnya di atas.

Sekarang kamu akan memberikan perkataan yang sama bunyi hujungnya dengan sebanyak mungkin dalam masa yang singkat. Kita akan membuat latihan terlebih dahulu. Bolehkah kamu beritahu saya perkataan yang hujungnya sama dengan dengan makan. Bersedia dengan perkataan yang hujungnya sama dengan makan. Mulai ... sekarang.

(Jangan beritahu murid jumlah masa yang dikira)

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus.

Apabila murid tidak memberikan jawapan selepas beberapa saat, berikan dorongan "bukan, sukan, ikan, lukan, – barang-barang ini tidak semestinya yang kamu nampak sekarang, kamu boleh memberikan apa saja perkataan yang hujungnya sama dengan bunyi ma**kan.**

✗ Jika jawapan murid salah, terangkan mengapa hal ini tidak betul:

'Kita tidak boleh menamakan X (sebut perkataan yang salah) sebab X tidak mempunyai hujung bunyi **kan.** Penghujung perkataan X adalah x.

Item Ujian Rhyme

1. lari

Sekarang kamu akan memberikan perkataan yang sama bunyi hujungnya dengan lari sebanyak yang mungkin dan pada masa yang singkat. Bersedia untuk menyebut perkataan yang sama bunyi hujungnya dengan lari.

Mulai... sekarang

(Jangan beritahu kiraan masa yang diperlukan)

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus. Berikan pujian pada usaha murid dan teruskan ke item 2.

2. parang

Sekarang kamu akan memberikan perkataan yang sama bunyi hujungnya dengan parang sebanyak yang mungkin dan pada masa yang singkat. Bersedia untuk menyebut perkataan yang sama bunyi hujungnya dengan parang.

Mulai... sekarang

(Jangan beritahu kiraan masa yang diperlukan)

Mulakan mengira masa apabila menyebut perkataan 'sekarang'

Berhenti mengira masa apabila tempoh 30 saat lupus. Berikan pujian pada usaha murid.

Non-word
Reading Test

The Non-Word Reading Test

Bahan digunakan:

- Borang rekod
- Non-word Reading Cards 1, 2 dan 3.

Susunan tugasan

Non-Word Reading Card 1 (3 item latihan)

⇩

Non-Word Reading Card 2 (10 non words, satu suku-kata)

⇩

Non-Word Reading Card 3 (10 non words, dua suku-kata)

Perkenalkan ujian ini kepada murid

Kita akan melihat beberapa perkataan yang lucu bunyinya dan tidak mempunyai erti langsung. Saya tahu kamu tidak pernah mendengar perkataan ini sebelumnya tapi saya mahu kamu cuba untuk membacanya

Item Latihan

Tunjukkan kepada murid

Non-Word Reading Card 1

Katakan:

Cuba kamu baca beberapa perkataan ini

✗ Jika jawapan murid salah atau tidak menjawapnya, berikan jawapan yang betul:

Lihat dengan teliti, perkataan ini ialah tib, ini ialah Lom dan Rad

(Berikan pujian pada usaha murid)

(Bersedia untuk Non-Word Reading Card 2)

Item Ujian

Non-Word Reading Card 2

Tunjukkan Card 2 dan katakan kepada murid:

Sekarang cuba kamu baca beberapa perkataan ini. Cuba dulu perkataan yang di sebelah kiri (sambil menunjukkan perkataan di sebelah kiri)

1. **pim**
2. **gat**
3. **fot**
4. **lub**
5. **hin**

(Berikan pujian pada usaha murid)

Jika murid dapat membaca sekurang-kurangnya salah **satu** dari perkataan di atas, teruskan dengan perkataan di sebelah kanan. Sambil menunjukkan perkataan di sebelah kanan, katakan kepada murid:

Sekarang cuba untuk membaca perkataan ini

6. **chog**
7. **trum**
8. **pran**
9. **nabe**
10. **khom**

(Berikan pujian pada usaha murid)

Jika murid dapat membaca sekurang-kurangnya **lima atau lebih** dari perkataan di dalam Card 2, lihatkan kepada murid Card 3.

Pada Card 2, berikan dorongan kepada murid, tetapi jangan berikan isyarat untuk menunjukkan bahawa jawapan yang diberikan adalah betul atau salah. Jika murid tidak berikan jawapan selepas 10 saat, berikan dorongan untuk mencubanya:

Bolehkan kamu mencuba perkataan ini

Jika murid tersebut menolaknya, tunjuk ke item seterusnya dan katakan kepada murid:

Inda apa, saya mahu tahu kalau kamu dapat mencuba yang ini

Apabila murid mengatakan, 'Saya tidak tahu', berikan dorongan untuk mencubanya.

Saya tahu kamu tidak pernah meilhat perkataan ini sebelumnya tapi boleh kamu mencubanya?

Jika murid menolak untuk meneruskannya lagi, anda harus menerimanya dengan cara yang menyakinkan:

Inda apa, cuba lagi yang lain

Non-Word Reading Card 3

Lihatkan Card 3 dan katakan kepada murid:

Sekarang saya mahu kamu cuba perkataan ini:

11. **haplut**
12. **yutmip**
13. **musnga**
14. **potfeg**
15. **shendom**
16. **kulnya**
17. **syaking**
18. **ropsat**
19. **khidrot**
20. **plutskir**

(Berikan pujian pada usaha murid)

Pada Card 3, berikan dorongan kepada murid, tetapi jangan berikan isyarat untuk menunjukkan bahawa jawapan yang diberikan adalah betul atau salah. Jika murid tidak berikan jawapan selepas 10 saat, berikan dorongan untuk mencubanya:

Bolehkan kamu mencuba perkataan ini

Jika murid tersebut menolaknya, tunjuk ke item seterusnya dan katakan kepada murid:

Inda apa, saya mahu tahu kalau kamu dapat mencuba yang ini

Apabila murid mengatakan, '**Saya tidak tahu**', berikan dorongan untuk mencubanya.

Saya tahu kamu tidak pernah meilhat perkataan ini sebelumnya tapi boleh kamu mencubanya?

Jika murid menolak untuk meneruskannya lagi, anda harus menerimanya dengan cara yang menyakinkan:

Inda apa, cuba lagi yang lain

Phonological Assessment Battery (PhAB)

Malay version

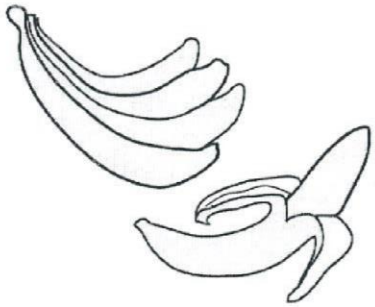
DISPLAY BOOKLET

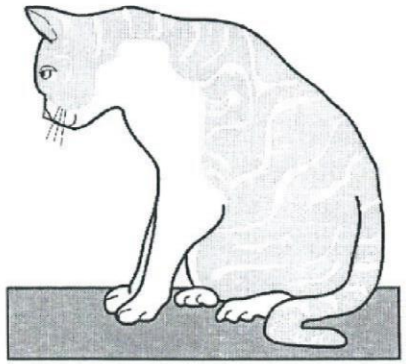
Norah Frederickson, Uta Frith, Rea Reason

Modified by:

Nor Irlenwati Haji Ismail

A





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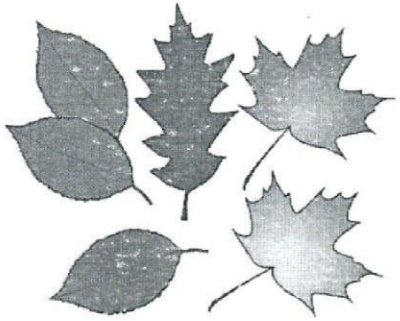
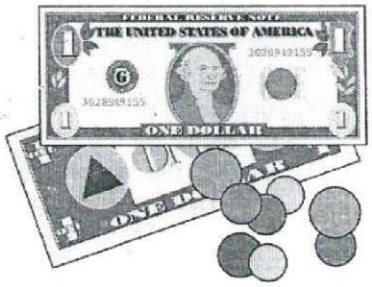
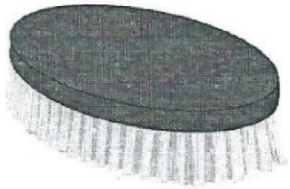
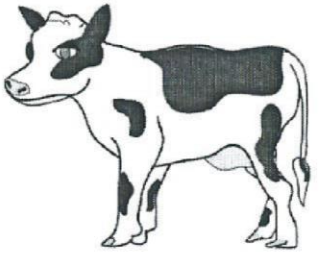
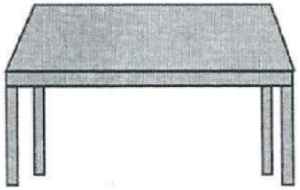
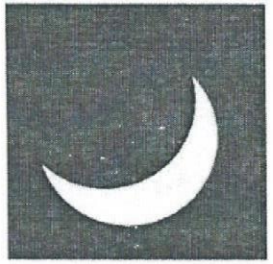
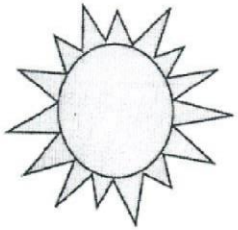
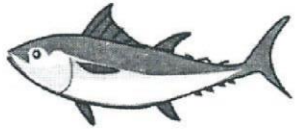






1			
2			
3			

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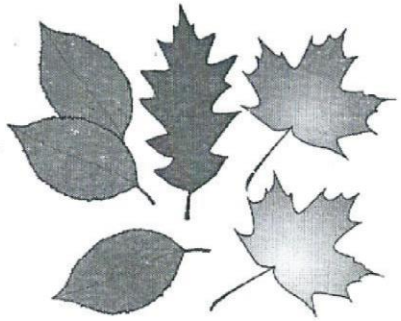

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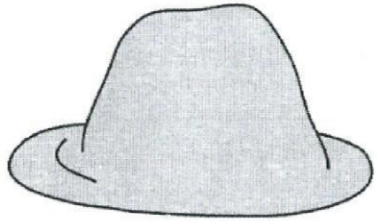

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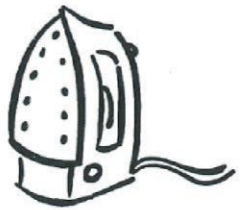

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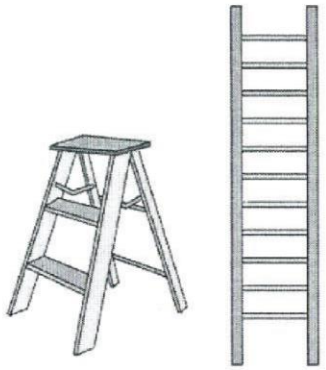

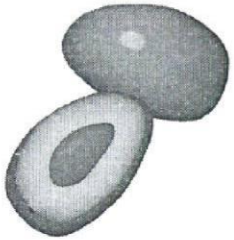

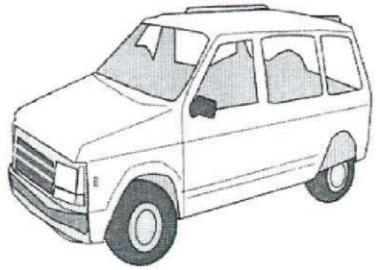

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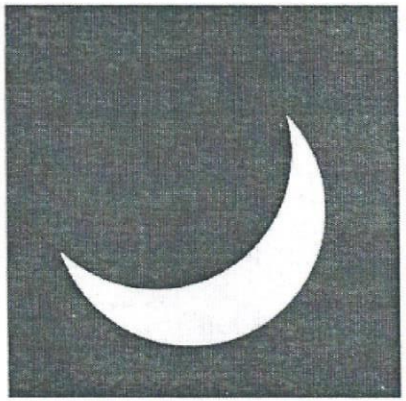

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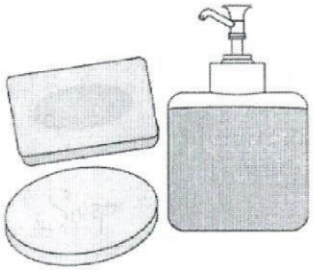

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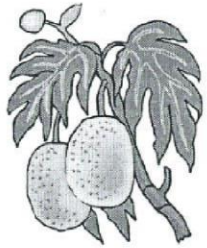
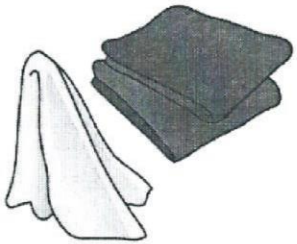
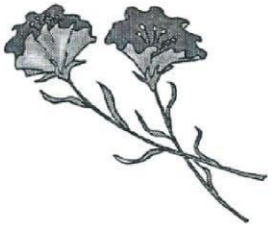
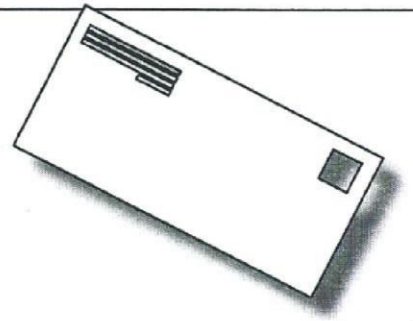
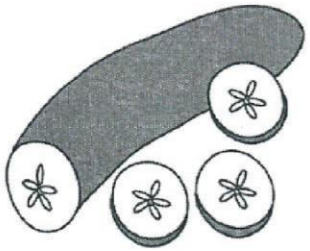
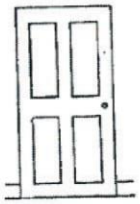
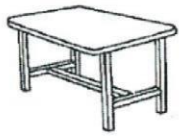
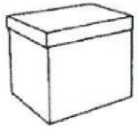


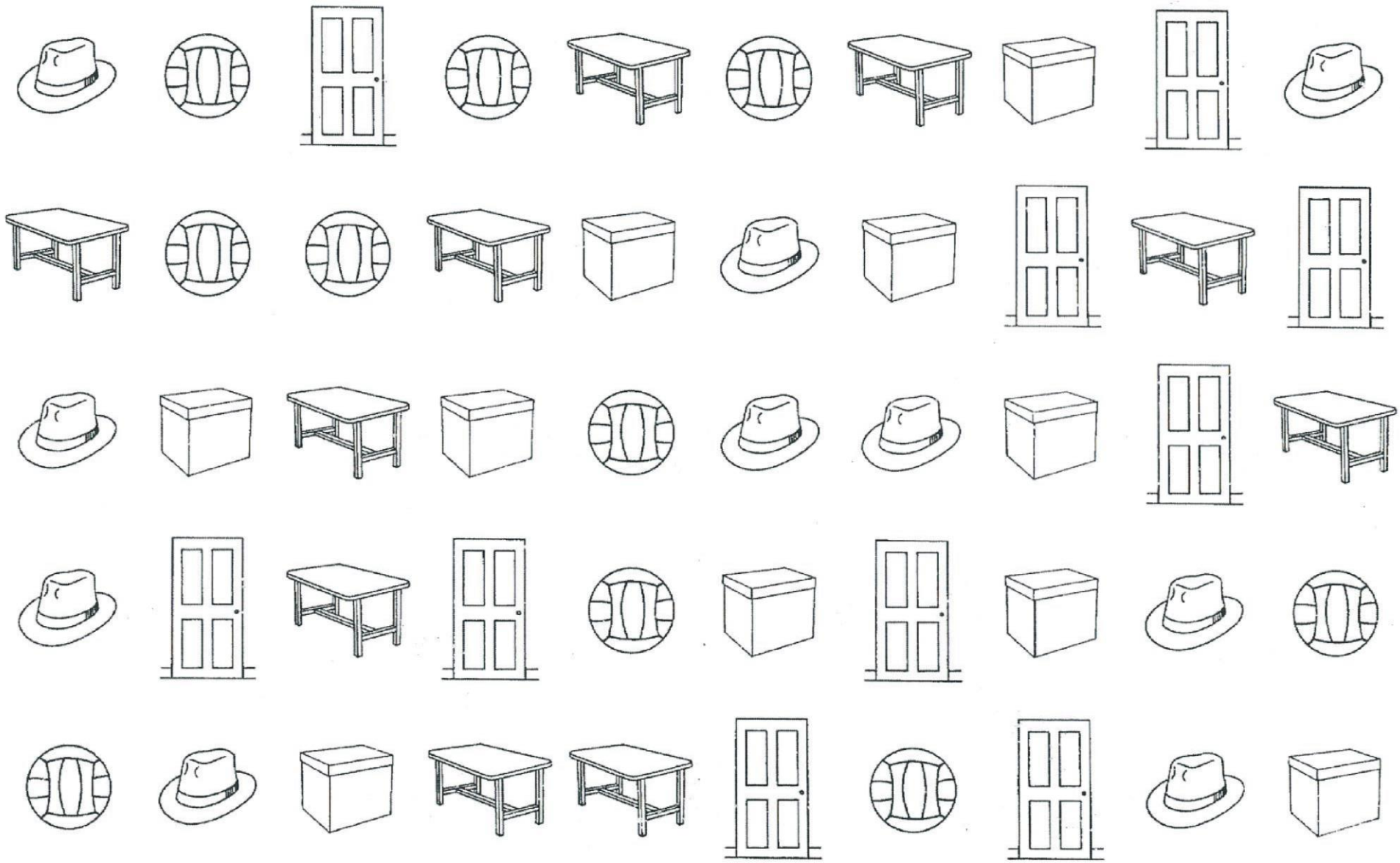
8			
9			
10			



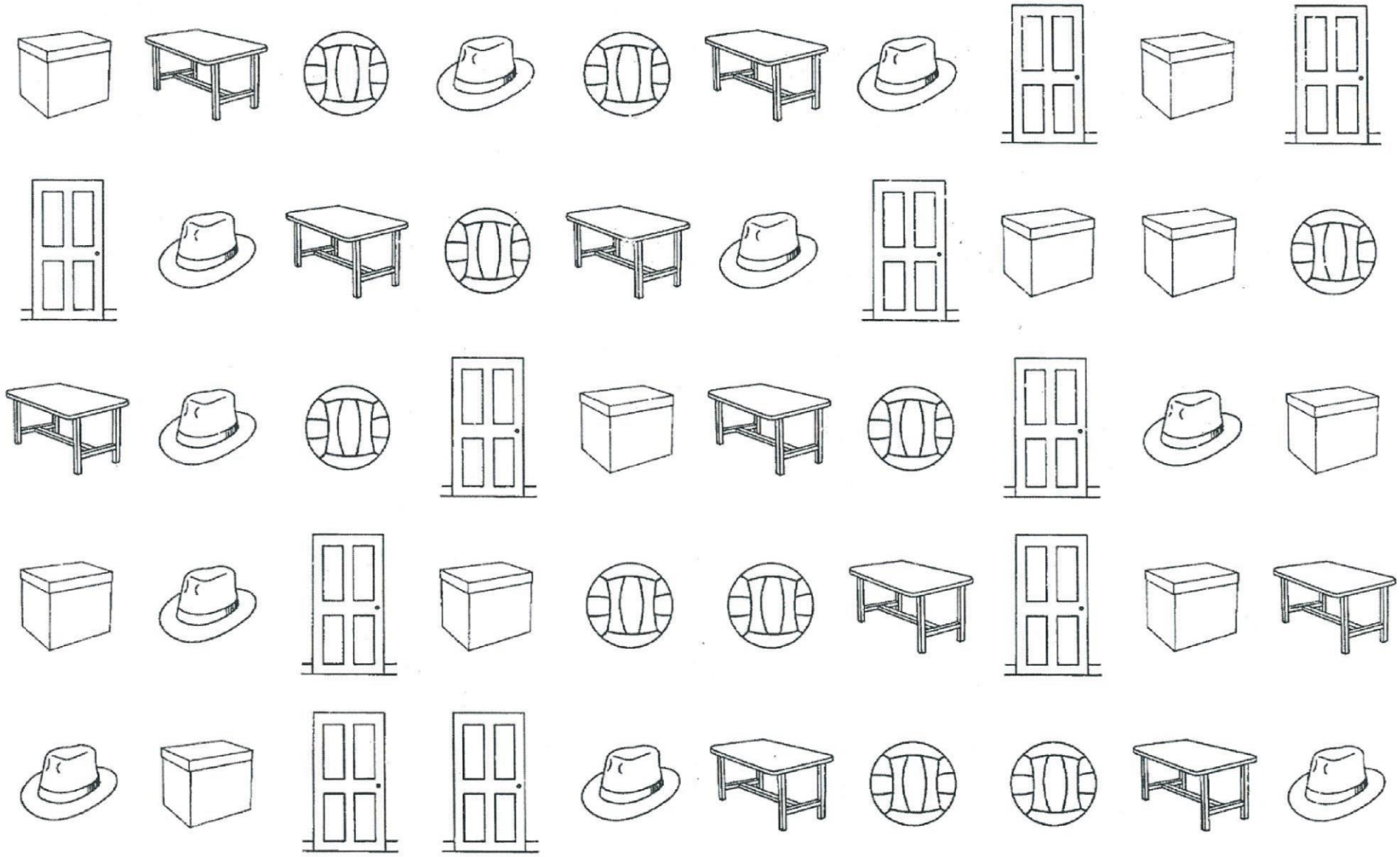




Picture Familiarization Card



Picture Naming Card 1



Picture Naming Card 2

3 6 8 1 4 5 2 9

Digit Naming Familiarization Card

23929 54635 55852 91549 12856 85811 45932 48431 83659 28896

58869 29852 24651 54919 36849 49354 26892 12463 81845 29496

tib

lom

rad

pim	chog
gat	trum
fot	pran
lub	nabe
hin	khom

haplut

yutmip

musnga

potfeg

shendom

kulnya

syaking

ropsat

khidrot

plutskir

Appendix 6: A sample letter to Ministry of Education, Brunei

Nor Irlenwati Haji Ismail
Bahagian Perkhidmatan Psikologi
Unit Pendidikan Khas
Kementerian Pendidikan
Jalan Pasar Baharu, Gadong
Brunei

14 Jun 2010

Pengarah
Jabatan Sekolah-Sekolah
Kementerian Pendidikan
Jalan Ong Sum Ping
Brunei

Cikgu,

Per: PERMOHONAN UNTUK MEMBUAT PENYELIDIKAN

Sukacita saya ingin membuat permohonan untuk membuat penyelidikan bagi *Doctorate Thesis* mengenai dengan "Standardisation and normalisation of Phonological Assessment Battery (PhAB) in Malay for Brunei population"

Untuk pengetahuan pihak Cikgu, pada masa ini saya sedang menjalani latihan dalam perkhidmatan bagi kursus Doctorate Educational Psychology in Child, Community and Educational Psychology di University of Exeter dan dalam tahun dua pengajian.

Oleh yang demikian, saya ingin memohon kebenaran dari pihak Cikgu untuk:

- Membuat kaji selidik dan menemuramah pegawai di Jabatan Sekolah-Sekolah, terutama sekali pegawai yang menjalankan program membaca yang berhubungkait dengan kurikulum SPN21.
- Membuat kaji selidik dan menemuramah pegawai, guru-guru dan penuntut di sekolah-sekolah rendah kerajaan.
- Membuat kaji selidik penuntut di sekolah-sekolah rendah kerajaan menggunakan Phonological Assessment Battery (PhAB) yang telah diterjemahkan kedalam Bahasa Melayu

Sekolah-sekolah yang telah dikenalpasti melalui 'randomised selection' adalah seperti berikut:

Daerah Brunei Muara	**Daerah Tutong**
• SR Raja Isteri Fatimah	• SR Lubok Pulau
• SR Dato Marsal	• SR Muda Hashim
• SR OKSB Kilanas	• SR Lamunin
• SR Mentiri	**Daerah Belait**
• SR Kiarong	• SR PSJ Pandan
• SR Pintu Malim	• SR Sg Liang
• SR Pehin Datu Jamil	**Daerah Temburong**
• SR Katok	• SR Kg Amo
• SR Panglima Berudin Limau Manis	

'Randomised selection' ini bertujuan untuk menghilangkan bias seleksi dalam pemilihan penuntut.

Bagi setiap sekolah, 12 orang penuntut akan dipilih melalui "randomised selection" iaitu 4 orang dari kalangan penuntut berumur 6 tahun, 4 orang dari kalangan penuntut berumur 8 tahun, dan 4 orang dari kalangan penuntut berumur 10 tahun.

Thesis mengenai dengan penyelidikan ini nanti akan diterbitkan di salah satu penerbit tempatan di United Kingdom dan penerbitan jurnal ini akan diedarkan ke Jabatan Sekolah-sekolah.

Bersama-sama ini, saya sertakan emel/surat dari Thesis supervisor yang akan menerangkan tujuan penyelidikan ini.

Besarlah harapan saya agar permohonan saya ini dapat dipertimbangkan bagi melaksanankan penyelidikan yang berkesan untuk kepentingan warga pendidikan secara amnya di masa akan datang.

Kerjasama dari pihak Cikgu tidak lupa diucapkan terima kasih.

Yang Benar,

NOR IRLENWATI HAJI ISMAIL
Alamat e-mel: nibh201@ex.ac.uk / irlen.ismail@gmail.com
No. Tel: +673 8 771007 (Brunei) / +44 7599720546 (UK)

Appendix 7: Approval letter from Ministry of Education

Telefon : +6732382621 [Talian terus]
Operator : +6732381133 Samb. 4401
Faks : +6732382873
Email : bps.moe@moe.edu.bn

بهاكين ڤنديديقن سواستا
ڤجابت كتوا ڤڠاره ڤنديديقن
كمنترين ڤنديديقن

BAHAGIAN PENDIDIKAN SWASTA
PEJABAT KETUA PENGARAH PENDIDIKAN
KEMENTERIAN PENDIDIKAN
BANDAR SERI BEGAWAN BB3510
NEGARA BRUNEI DARUSSALAM

Rujukan Kami : KPE/DG/BPS/C/50 Pt.2
Our Reference

18 Rejab 1431
30 Jun 2010

Yang Mulia,
Dayang Nor Irlenwati binti Haji Ismail
Bahagian Perkhidmatan Psikologi
Unit Pendidikan Khas
Kementerian Pendidikan
Jalan Pasar Baharu, Gadong
Negara Brunei Darussalam

Dayang,

PERMOHONAN UNTUK MEMBUAT PENYELIDIKAN

Dengan hormat sukacita merujuk surat Dayang bertarikh 29 Jun 2010 yang ada hubungannya dengan perkara yang tersebut di atas.

Sehubungan dengan itu, Bahagian Pendidikan Swasta, Kementerian Pendidikan tiada halangan untuk Dayang untuk membuat penyelidikan khusus bagi menyiapkan *Doctorate Thesis* yang bertajuk *Standardisation and normalization of Phonetics Assessment Battery (PhAB) in Malay for Brunei population* tertakluk kepada kesudian pihak sekolah.

Sekolah-sekolah swasta yang akan dilibatkan dalam penyelidikan itu nanti ialah :-

a) Sekolah St. Andrew
b) Sekolah Stella
c) Sekolah Nusa Laila Puteri, Beribi
d) Sekolah Rendah Yayasan Sultan Haji Hassanal Bolkiah
e) Sekolah Antarabangsa Brunei
f) Sekolah Nusa Jaya, Keriam
g) Sekolah St. Angela

Sekian, wassalam.

" Kasih Sayang Tersemai, Keluarga Rukun Damai "

(AWG HAJI MOHAMMED BIN JAMBUL)
Pegawai Tugas-Tugas Khas Kanan
Ketua Bahagian Pendidikan Swasta
Kementerian Pendidikan

Sk: Setiausaha Tetap (CE) Kementerian Pendidikan
Ketua Pengarah Pendidikan
Daily Record

PS1/K3

Appendix 8: Consent letter for parents

Dear Parent,

Your school has agreed to take part in a piece of research with the Educational Psychology Service. The aim of the research is to find out your child's phonological awareness (P.A). The data will in turn be used by the Ministry of Education to inform the future planning of children's literacy.

For this research we will be looking at the phonological of children in year 1, 3 and 5. We will be assessing your child's PA by working individually with them for about 30 minutes using the Phonological Assessment Battery (Malay version).

I would like to take the opportunity to state that all information will remain confidential, and that all the collected data will be conducted and used in a respectful and responsible manner.

If you are **NOT** happy for your child's anonymised details to be used in this research, please complete this slip below.

At any time during the research you have the right to request your child to be withdrawn from the research.

For any further information, please contact the school.

Yours sincerely,

Nor Irlenwati Haji Ismail
University of Exeter,
United Kingdom

.....

I **DO NOT** give permission for my child

(NAME)..... (CLASS)……..……to take part in this piece of research.

Signed.....

Appendix 9: MPhAB Development & Training Itinerary

Appendix 9: MPhAB development & Training: Summary of itinerary (Adapted from the researcher's work diary)

Day	Date	Agenda	Involvement	Venue
1	05/06/2010	Research assistants interview using Skype - Shortlisted RA notified	Irlen	From UK
2	29/06/2010	Letter sent to Ministry of Education, the Department of Schools	Irlen	From UK
3	30/06/2010	Approval granted from Ministry of Education	Irlen	
4	01/07/2010	A follow up letter to schools was sent. Consent letters sent to parents	Irlen	
5	01/07/2010	Meeting – Modification of PhAB To discuss: - the suitability of the items - the suitability of pictures used	Irlen All RAs	UPK Ground Floor
6	03/07/2010	PhAB Training – Part 1 (am) 1) Introduction to PhAB - Details from the original manual 2) Rationale and test battery development - Details from the original manual (Pg 66-70) PhAB Training – Part 2 - Assessment: Testing procedures and standards Modified PhAB Training – Part 3 (pm) 1) Alliteration test 2) Supplementary Alliteration test 3) Practice with peers	Irlen All RAs	UPK Ground Floor
7	07/07/2010	Modified PhAB Training – Part 3 1) Naming speed test 2) Rhyme test 3) Practice with peers	Irlen All RAs	UPK 3rd Floor
8	08/07/2010	Preliminary school visits – Part 1	Dk Amal, Ardiah & Irlen	Meet up at 326, Jln 77
	10/07/2010	Public Holiday		

Day	Date	Agenda	Involvement	Venue
9	12/07/2010 (am) (pm) Practice the modified PhAB	PhAB Training – Part 3 - Spoonerisms test - Fluency test - Debriefing - Video on the administration of PhAB Contacting schools regarding: - The collected parental consent form - Dates to conduct the data collection - Preliminary school visits for some schools (RA familiarization)	All RAs Irlen RA	UPK 3rd Floor UPK Own venue
10	13/07/2010 (am)	Preliminary school visit Part 2 SR RIF, SR Pintu Malim SR Pehin Dato Jamil, SR Panglima Berudin SR Kiarong & SR Katok	Irlen, Nieda, Dk Amal & Ardiah	Meet up at 326 at 8am
	(pm)	PhAB Training – Part 4 - Each RA to conduct PhAB, assessed by an EP & researcher - Feedback - Question & Answer session * Ensure that all RA have received the copy of the modified PhAB manual * Record forms have been photocopied	All RAs	UPK (1.30pm)
11	14/07/2010	Preliminary school visits Part 4 KB & Tutong school visit SR Lubok Pulau, SR Muda Hashim SR Lamunin, St Angela's Seria, SR PSJ Pandan & SR Sg Liang	Fadzillah, Nieda, Amal & Ardiah	Meet up at 326 (6.45am)
	15/07/2010	Public Holiday		
12	17/07/2010	PhAB Training – Part 5 - Assessing the RAs as test administrator of MPhAB	Amal, Ardiah &Nieda	Meet up at 326
	19/07/2010 – 31/08/2010	Data collection	Irlen & All RAs	At their respective venues
	03/09/2010 – 19/09/2010	School holiday		

Appendix 10: PhAB Tables of standardized scores (Source: PhAB, Page 113-123)

Appendix 6

Tables of standardized scores

Table A6.1 Standardized scores for the Alliteration Test

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11
0	69	69	69	69	69	69	69	69	69	69	69	69
1	79	76	74	72	71	69	69	69	69	69	69	69
2	84	81	78	77	75	74	72	70	69	69	69	69
3	87	84	82	80	78	77	75	73	72	70	69	69
4	90	87	84	82	81	79	78	76	74	73	71	69
5	93	90	86	85	83	82	80	78	77	75	73	72
6	96	93	90	87	85	84	82	81	79	77	76	74
7	99	96	93	91	89	86	85	83	81	80	78	77
8	102	99	96	95	93	90	88	86	85	83	81	80
9	105	103	101	100	98	96	94	92	90	88	86	84
10	106+	104+	102+	100+	100+	100+	100+	100+	100+	100+	100+	100+

Table A6.2 Standardized scores for the Rhyme Test

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
0–1	72	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
2	80	78	74	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69
3	85	83	79	76	72	69	69	69	69	69	69	69	69	69	69	69	69	69
4	89	87	83	80	75	73	70	69	69	69	69	69	69	69	69	69	69	69
5	93	90	86	83	79	76	73	70	70	69	69	69	69	69	69	69	69	69
6	95	93	89	86	81	79	76	73	72	70	69	69	69	69	69	69	69	69
7	98	95	91	89	84	81	78	76	75	72	70	69	69	69	69	69	69	69
8	100	97	94	91	86	83	81	78	77	74	73	70	69	69	69	69	69	69
9	102	100	96	93	88	86	83	80	79	77	75	72	69	69	69	69	69	69
10	103	102	98	95	90	88	85	82	82	79	77	74	72	69	69	69	69	69
11	105	103	100	97	93	90	87	84	84	81	79	76	74	71	69	69	69	69
12	106	104	102	100	95	92	89	87	86	83	81	79	76	73	70	69	69	69
13	107	105	103	102	97	94	92	89	88	85	84	81	78	75	73	70	69	69
14	108	107	104	103	99	97	94	91	90	88	86	83	80	78	75	72	69	69
15	109	108	105	104	101	99	96	94	93	90	88	86	83	80	77	75	72	69
16	111	109	107	106	102	101	99	96	96	93	91	88	86	83	80	77	75	72
17	112	111	109	107	104	102	101	99	99	96	94	92	89	86	83	81	78	75
18	114	113	111	109	106	104	103	101	102	100	98	95	93	90	87	84	82	79
19	117	116	113	112	108	107	106	104	105	103	103	101	98	95	92	90	87	84
20	121	120	118	116	113	111	110	108	109	108	107	106	104	103	101	98	95	92
21	131	131	131	131	131	131	131	131	131	128	128	127	125	124	122	121	119	118

Table A6.3 Standardized scores for the Spoonerisms Test

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
0–1	83	81	78	76	74	72	70	69	69	69	69	69	69	69	69	69	69	69
2	89	87	84	82	80	79	77	75	73	71	70	69	69	69	69	69	69	69
3	93	91	88	86	84	82	81	79	77	75	74	72	71	69	69	69	69	69
4	96	94	91	89	87	85	83	81	80	78	77	75	74	72	69	69	69	69
5	99	97	94	91	89	88	86	84	82	80	79	77	76	74	74	72	69	69
6	102	99	96	94	91	89	88	86	84	82	81	79	78	76	76	74	72	69
7	104	101	98	96	94	91	89	87	86	84	83	81	80	78	77	75	74	72
8	106	103	100	98	95	93	91	89	87	85	84	82	82	80	79	77	75	73
9	107	105	102	99	97	95	93	90	88	87	86	84	83	81	80	78	76	75
10	109	107	103	101	99	96	94	92	90	88	87	85	84	82	82	80	78	76
11	111	108	105	103	100	98	96	93	91	89	88	86	86	84	83	81	79	77
12	112	110	107	104	102	99	97	95	93	90	90	88	87	85	84	82	80	78
13	114	111	108	106	103	101	99	96	94	92	91	89	88	86	85	83	81	80
14	115	113	109	107	105	102	100	98	96	93	92	90	89	87	86	85	83	81
15	117	114	111	109	106	104	102	99	97	95	93	91	90	88	88	86	84	82
16	118	116	112	110	108	105	103	101	98	96	95	92	91	90	89	87	85	83
17	119	117	114	111	109	107	104	102	100	97	96	94	93	91	90	88	86	84
18	121	119	115	113	111	108	106	104	101	99	98	95	94	92	91	89	87	85
19	123	120	117	114	112	110	107	105	103	100	99	97	96	93	92	90	89	87
20	124	122	118	116	114	111	109	107	104	102	101	98	97	95	94	92	90	88
21	126	123	120	118	115	113	111	108	106	104	102	100	99	96	95	93	91	89
22	128	125	122	119	117	115	112	110	108	105	104	102	100	98	97	95	93	91
23	129	127	124	121	119	117	114	112	110	107	106	104	102	100	99	96	94	92
24	131	129	126	124	121	119	117	114	112	109	108	106	104	102	101	99	96	94
25	131	131	128	126	124	121	119	117	114	112	111	108	107	105	103	101	99	96
26	131	131	131	129	126	124	122	119	117	115	113	111	110	107	106	104	101	99
27	131	131	131	131	131	128	125	123	121	118	117	115	113	111	110	107	105	103
28	131	131	131	131	131	131	131	128	125	123	122	119	118	116	114	112	110	107
29	131	131	131	131	131	131	131	131	131	131	130	127	126	124	122	120	117	115
30	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131

Tables A6.4 Standardized score for the Non-Word Reading Test

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
1	87	84	82	80	78	76	75	73	71	70	69	69	69	69	69	69	69	69
2	93	90	87	85	84	82	80	79	77	75	73	72	70	69	69	69	69	69
3	96	93	91	89	87	86	84	82	80	79	77	75	74	72	70	69	69	69
4	98	96	93	92	90	88	86	85	83	81	80	78	76	74	73	71	69	69
5	100	98	95	94	92	90	89	87	85	83	82	80	78	77	75	73	71	70
6	102	99	97	95	94	92	90	89	87	85	84	82	80	78	77	75	73	72
7	103	101	98	97	95	94	92	90	89	87	85	84	82	80	78	77	75	73
8	105	102	100	98	97	95	94	92	90	89	87	85	83	82	80	78	77	75
9	106	104	101	100	98	96	95	93	92	90	88	87	85	83	82	80	78	76
10	107	105	102	101	99	98	96	95	93	92	90	88	87	85	83	81	80	78
11	109	106	104	102	101	99	98	96	95	93	91	90	88	86	85	83	81	79
12	110	108	105	104	102	101	99	97	96	94	93	91	90	88	86	84	83	81
13	111	109	107	105	103	102	100	99	97	96	94	93	91	89	88	86	84	83
14	112	110	108	107	105	103	102	100	99	97	96	94	93	91	89	88	86	84
15	114	111	109	108	107	105	104	102	101	99	97	96	94	93	91	90	88	86
16	115	113	111	110	109	107	106	104	102	101	99	98	96	95	93	92	90	88
17	117	115	113	111	110	109	108	106	105	103	102	100	99	97	96	94	93	91
18	119	117	115	114	113	111	110	109	108	106	105	103	102	100	99	97	96	94
19	123	121	119	117	116	115	114	113	112	111	109	108	107	105	104	102	101	99
20	131	131	131	131	131	131	131	131	130	129	128	126	125	124	123	122	121	120

Table A6.5 Standardized scores for the Naming Speed Test (Pictures)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
<52	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
52–53	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	128	125
54	131	131	131	131	131	131	131	131	131	131	131	131	131	131	129	126	123	121
56	131	131	131	131	131	131	131	131	131	131	131	131	130	128	125	122	119	116
58	131	131	131	131	131	131	131	131	131	131	131	130	127	124	121	118	115	113
60	131	131	131	131	131	131	131	131	131	131	129	126	123	121	118	115	112	109
62	131	131	131	131	131	131	131	131	131	129	126	123	120	117	115	112	109	105
64	131	131	131	131	131	131	131	131	129	126	123	120	117	115	112	109	105	102
66	131	131	131	131	131	131	131	129	126	123	120	117	115	112	109	106	102	99
68	131	131	131	131	131	131	129	126	123	121	118	115	112	109	106	103	100	97
70	131	131	131	131	131	129	127	124	121	118	115	113	110	106	103	100	97	95
72	131	131	131	131	130	127	124	122	119	116	113	110	107	104	101	98	95	93
74	131	131	131	131	128	125	122	119	117	114	111	108	105	101	99	96	93	91
76	131	131	131	129	126	123	120	117	115	112	109	105	102	99	97	94	92	90
78	131	131	129	127	124	121	118	115	113	110	106	103	100	97	95	92	90	88
80	131	130	128	125	122	119	116	113	111	107	104	101	98	95	93	91	89	87
82	131	129	126	123	120	117	114	112	108	105	102	99	96	94	92	90	87	85
84	130	127	124	121	118	115	113	110	106	103	100	97	95	93	90	88	86	84
86	128	125	122	119	117	114	111	108	104	101	98	96	93	91	89	87	84	82
88	126	123	120	118	115	112	109	106	103	100	97	94	92	90	88	85	83	81
90	124	122	119	116	113	110	107	104	101	98	95	93	91	89	86	84	82	79
92	123	120	117	114	112	108	105	102	99	96	94	92	89	87	85	83	80	78
94	121	118	116	113	110	107	103	100	98	95	93	90	88	86	84	81	79	77
96	120	117	114	111	108	105	102	99	96	94	91	89	87	85	82	80	78	76
98	118	115	112	109	106	103	100	97	95	92	90	88	86	83	81	79	77	74
100	117	114	111	108	105	101	98	96	93	91	89	87	84	82	80	78	75	73
102	115	112	109	106	103	100	97	94	92	90	88	86	83	81	79	76	74	72
104	114	111	107	104	101	98	96	93	91	89	87	84	82	80	78	75	73	71
106	112	109	106	103	100	97	94	92	90	88	85	83	81	79	76	74	72	70
108	111	107	104	101	98	95	93	91	89	87	84	82	80	77	75	73	71	69
110	109	106	103	100	97	94	92	90	88	85	83	81	79	76	74	72	70	69
112	107	104	101	98	95	93	91	89	87	84	82	80	77	75	73	71	69	69
114	106	103	100	97	94	92	90	88	85	83	81	79	76	74	72	69	69	69
116	104	101	98	95	93	91	89	86	84	82	80	77	75	73	71	69	69	69
118	103	100	97	94	92	90	88	85	83	81	79	76	74	72	69	69	69	69
120	101	98	95	93	91	89	86	84	82	80	77	75	73	71	69	69	69	69
122	100	97	94	92	90	88	85	83	81	79	76	74	72	69	69	69	69	69
124	98	95	93	91	89	86	84	82	80	77	75	73	71	69	69	69	69	69
126	97	94	92	90	88	85	83	81	79	76	74	72	69	69	69	69	69	69
128	95	93	91	89	86	84	82	80	77	75	73	71	69	69	69	69	69	69
130	94	92	90	88	85	83	81	78	76	74	72	69	69	69	69	69	69	69
132	93	91	89	86	84	82	80	77	75	73	71	69	69	69	69	69	69	69
134	92	90	88	85	83	81	78	76	74	72	69	69	69	69	69	69	69	69
136	91	89	86	84	82	80	77	75	73	70	69	69	69	69	69	69	69	69
138	90	87	85	83	81	78	76	74	72	69	69	69	69	69	69	69	69	69
140	88	86	84	82	79	77	75	73	70	69	69	69	69	69	69	69	69	69
142	87	85	83	80	78	76	74	71	69	69	69	69	69	69	69	69	69	69
144	86	84	81	79	77	75	72	70	69	69	69	69	69	69	69	69	69	69
146	85	82	80	78	76	73	71	69	69	69	69	69	69	69	69	69	69	69
148	83	81	79	77	74	72	70	69	69	69	69	69	69	69	69	69	69	69

Table A6.5 (continued)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
150	82	80	78	75	73	71	69	69	69	69	69	69	69	69	69	69	69	69
152	81	79	76	74	72	69	69	69	69	69	69	69	69	69	69	69	69	69
154	79	77	75	73	70	69	69	69	69	69	69	69	69	69	69	69	69	69
156	78	76	73	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69
158	77	74	72	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69
160	75	73	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
162	74	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
164	72	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
166	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
168	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
170+	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69

Table A6.6 Standardized scores for the Naming Speed Test (Digits)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
<24	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
24–25	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
26	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	129	126
28	131	131	131	131	131	131	131	131	131	131	131	131	131	129	126	122	120	117
30	131	131	131	131	131	131	131	131	131	131	131	129	125	122	118	115	113	109
32	131	131	131	131	131	131	131	131	131	129	126	123	119	116	113	109	107	104
34	131	131	131	131	131	131	131	131	128	124	121	118	114	111	108	104	102	99
36	131	131	131	131	131	131	131	127	123	120	117	113	110	107	103	100	98	94
38	131	131	131	131	131	129	126	123	119	116	113	109	106	103	99	96	94	91
40	131	131	131	131	129	126	123	119	116	113	109	106	102	99	96	93	91	88
42	131	131	131	129	126	123	119	116	113	109	106	103	99	96	93	90	88	85
44	131	131	131	126	123	120	116	113	110	106	103	100	96	93	90	87	86	83
46	131	131	127	124	120	117	114	110	107	103	100	97	94	90	88	85	83	81
48	131	129	124	121	118	114	111	108	104	101	98	94	91	88	86	83	81	78
50	129	126	122	118	115	112	108	105	102	98	95	92	89	86	84	81	79	76
52	127	124	119	116	113	109	106	103	99	96	93	90	87	84	82	79	77	74
54	125	122	117	114	111	107	104	100	97	94	91	88	85	83	80	77	75	73
56	123	119	115	112	108	105	102	98	95	92	89	86	84	81	78	75	74	71
58	121	117	113	110	106	103	100	96	93	90	87	85	82	79	76	74	72	69
60	119	115	111	108	104	101	98	95	91	88	86	83	80	78	75	72	70	69
62	117	114	109	106	102	99	96	93	90	87	84	81	79	76	73	70	69	69
64	115	112	107	104	101	97	94	91	88	85	83	80	77	74	72	69	69	69
66	113	110	106	102	99	96	92	89	87	84	81	78	76	73	70	69	69	69
68	112	108	104	100	97	94	91	88	85	83	80	77	74	72	69	69	69	69
70	110	106	102	99	96	92	89	87	84	81	78	76	73	70	69	69	69	69
72	108	105	100	97	94	91	88	85	83	80	77	74	72	69	69	69	69	69
74	107	103	99	96	92	89	87	84	81	78	76	73	70	69	69	69	69	69
76	105	102	97	94	91	88	85	83	80	77	74	72	69	69	69	69	69	69
78	103	100	96	93	90	87	84	81	79	76	73	70	69	69	69	69	69	69
80	102	99	94	91	88	86	83	80	77	75	72	69	69	69	69	69	69	69
82	100	97	93	90	87	84	82	79	76	73	71	69	69	69	69	69	69	69
84	99	96	92	89	86	83	80	78	75	72	70	69	69	69	69	69	69	69
86	98	94	90	88	85	82	79	77	74	71	69	69	69	69	69	69	69	69
88	96	93	89	86	84	81	78	75	73	70	69	69	69	69	69	69	69	69
90	95	92	88	85	82	80	77	74	71	69	69	69	69	69	69	69	69	69
92	94	91	87	84	81	79	76	73	70	69	69	69	69	69	69	69	69	69
94	92	89	86	83	80	77	75	72	69	69	69	69	69	69	69	69	69	69
96	91	88	85	82	79	76	74	71	69	69	69	69	69	69	69	69	69	69
98	90	87	83	81	78	75	72	70	69	69	69	69	69	69	69	69	69	69
100	89	86	82	80	77	74	71	69	69	69	69	69	69	69	69	69	69	69
102	88	85	81	78	76	73	70	69	69	69	69	69	69	69	69	69	69	69
104	87	84	80	77	75	72	69	69	69	69	69	69	69	69	69	69	69	69
106	85	83	79	76	74	71	69	69	69	69	69	69	69	69	69	69	69	69
108	84	82	78	75	72	70	69	69	69	69	69	69	69	69	69	69	69	69
110	83	81	77	74	71	69	69	69	69	69	69	69	69	69	69	69	69	69
112	82	79	76	73	70	69	69	69	69	69	69	69	69	69	69	69	69	69
114	81	78	75	72	69	69	69	69	69	69	69	69	69	69	69	69	69	69
116	80	77	74	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69
118	79	76	72	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69
120	78	75	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69

Table A6.6 (continued)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
122	77	74	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
124	76	73	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
126	74	72	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
128	73	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
130	72	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
132	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
134	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
136	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
138	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
140+	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69

Table A6.7 Standardized scores for the Fluency Test (Alliteration)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
0–1	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
2	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
3	74	72	70	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
4	81	79	78	76	74	72	70	69	69	69	69	69	69	69	69	69	69	69
5	87	85	83	82	80	78	76	74	72	71	69	69	69	69	69	69	69	69
6	92	90	88	87	85	83	81	79	77	75	74	72	70	69	69	69	69	69
7	97	95	93	91	89	87	85	83	82	80	78	76	74	72	72	69	69	69
8	102	100	98	95	93	91	89	87	86	84	82	80	78	76	76	75	74	69
9	106	104	102	100	97	95	93	91	89	87	85	84	82	80	79	78	77	76
10	110	108	106	104	101	99	97	95	93	91	89	87	85	83	82	82	81	79
11	113	111	109	108	105	103	101	99	96	94	92	90	88	86	86	85	84	82
12	115	114	112	110	109	107	105	102	100	98	96	93	91	89	89	88	87	85
13	118	116	115	113	111	110	108	106	104	101	99	97	95	92	91	91	90	88
14	120	119	117	115	114	112	111	109	107	105	103	100	98	96	95	93	93	91
15	123	121	120	118	116	115	113	111	110	108	106	104	101	99	98	97	96	94
16	125	124	122	120	119	117	115	114	112	111	109	107	105	103	101	100	99	97
17	128	126	124	123	121	119	118	116	115	113	111	110	108	106	105	103	102	100
18	130	128	127	125	124	122	120	119	117	115	114	112	111	109	108	107	105	103
19	131	131	129	128	126	124	123	121	119	118	116	115	113	111	111	110	109	107
20	131	131	131	130	128	127	125	124	122	120	119	117	115	114	113	113	112	110
21	131	131	131	131	131	129	128	126	125	123	121	120	118	116	116	115	115	113
22	131	131	131	131	131	131	130	129	127	126	124	122	121	119	118	118	117	116
23	131	131	131	131	131	131	131	131	130	128	127	125	123	122	121	121	120	118
24	131	131	131	131	131	131	131	131	131	131	130	128	126	125	124	124	123	121
25	131	131	131	131	131	131	131	131	131	131	131	131	130	128	127	127	126	124
26	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	130	130	128
27+	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131

Table A6.8 Standardized scores for the Fluency Test (Rhyme)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
0–1	80	77	73	72	70	69	69	69	69	69	69	69	69	69	69	69	69	69
2	89	87	83	81	80	79	78	76	75	74	72	71	70	69	69	69	69	69
3	95	93	88	87	86	85	83	82	81	80	78	77	76	75	73	72	71	70
4	101	98	93	91	90	89	88	86	85	84	83	81	80	79	78	76	75	74
5	106	104	99	97	95	93	91	90	89	87	86	85	84	82	81	80	79	77
6	111	108	103	101	99	97	96	94	92	90	89	88	87	85	84	83	82	80
7	115	112	107	105	103	101	100	98	96	94	92	91	89	88	87	85	84	83
8	119	116	111	109	107	105	103	101	99	98	96	94	92	90	89	88	87	85
9	123	120	115	113	110	108	107	105	103	101	99	97	95	93	91	90	89	88
10	126	123	118	116	114	112	110	108	106	104	102	100	98	96	95	93	91	90
11	130	127	122	119	117	115	113	111	109	107	105	103	101	100	98	96	94	92
12	133	130	125	123	121	119	116	114	112	110	108	106	104	103	101	99	97	95
13	131	133	128	126	124	122	120	118	116	113	111	109	107	105	104	102	100	98
14	131	131	131	129	127	125	123	121	119	117	115	112	110	108	106	105	103	101
15	131	131	131	131	130	128	126	124	122	120	118	116	114	112	109	107	106	104
16	131	131	131	131	131	131	129	127	125	123	121	119	117	115	113	111	109	107
17	131	131	131	131	131	131	131	131	129	127	124	122	120	118	116	114	112	110
18	131	131	131	131	131	131	131	131	131	130	128	126	124	122	120	118	115	113
19	131	131	131	131	131	131	131	131	131	131	131	130	128	125	123	121	119	117
20	131	131	131	131	131	131	131	131	131	131	131	131	131	129	127	125	123	121
21	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	130	128	126
22	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	130
23+	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131

Tables A6.9 Standardized scores for the Fluency Test (Semantic)

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11	9:00–9:05	9:06–9:11	10:00–10:05	10:06–10:11	11:00–11:05	11:06–11:11	12:00–12:05	12:06–12:11	13:00–13:05	13:06–13:11	14:00–14:05	14:06–14:11
0–1	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
2	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
3	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
4	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
5	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
6	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
7	72	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
8	77	74	71	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
9	82	79	76	72	69	69	69	69	69	69	69	69	69	69	69	69	69	69
10	87	83	80	77	74	70	69	69	69	69	69	69	69	69	69	69	69	69
11	91	87	84	81	78	74	71	69	69	69	69	69	69	69	69	69	69	69
12	94	91	88	85	82	78	75	72	69	69	69	69	69	69	69	69	69	69
13	97	95	92	88	85	82	79	75	72	69	69	69	69	69	69	69	69	69
14	101	98	95	92	89	85	82	79	76	72	69	69	69	69	69	69	69	69
15	103	101	98	95	92	89	86	82	79	76	73	69	69	69	69	69	69	69
16	106	103	101	98	95	92	89	86	82	79	76	73	69	69	69	69	69	69
17	109	106	103	101	98	95	92	89	86	82	79	76	72	69	69	69	69	69
18	112	109	106	103	100	98	95	92	89	85	82	79	76	72	69	69	69	69
19	114	111	109	106	103	100	97	95	92	88	85	82	79	75	73	69	69	69
20	117	114	111	108	106	103	100	97	94	91	88	85	82	78	76	73	69	69
21	119	116	114	111	108	105	103	100	97	94	91	88	85	81	79	76	74	69
22	122	119	116	113	111	108	105	102	100	97	94	91	88	84	82	79	77	73
23	124	121	119	116	113	110	108	105	102	99	96	94	91	87	85	82	79	76
24	127	124	121	118	116	113	110	107	105	102	99	96	93	90	88	85	82	79
25	129	126	124	121	118	115	113	110	107	104	102	99	96	93	91	88	85	82
26	131	129	126	123	121	118	115	112	110	107	104	101	99	96	94	91	88	85
27	131	131	129	126	123	120	118	115	112	110	107	104	101	98	96	94	91	88
28	131	131	131	128	126	123	120	118	115	112	109	107	104	101	99	96	94	91
29	131	131	131	131	128	126	123	120	118	115	112	109	107	104	102	99	97	94
30	131	131	131	131	131	128	126	123	120	118	115	112	109	107	105	102	100	97
31	131	131	131	131	131	131	129	126	123	120	118	115	112	109	108	105	103	100
32	131	131	131	131	131	131	131	129	126	123	121	118	115	112	111	108	106	103
33	131	131	131	131	131	131	131	131	129	126	124	121	118	115	114	111	109	106
34	131	131	131	131	131	131	131	131	131	130	127	124	121	119	117	114	113	110
35	131	131	131	131	131	131	131	131	131	131	130	128	125	122	120	118	116	113
36	131	131	131	131	131	131	131	131	131	131	131	131	129	126	124	121	120	117
37	131	131	131	131	131	131	131	131	131	131	131	131	131	130	128	125	124	121
38	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	130	128	125
39	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	130
40+	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131

Table A6.10 Standardized scores for the Alliteration Test with Pictures

Raw score	6:00–6:05	6:06–6:11	7:00–7:05	7:06–7:11	8:00–8:05	8:06–8:11
0	69	69	69	69	69	69
1	69	69	69	69	69	69
2	70	69	69	69	69	69
3	74	72	71	70	69	69
4	77	76	74	73	71	70
5	80	79	77	76	75	73
6	83	82	80	79	78	76
7	87	85	84	82	81	80
8	91	89	88	87	85	84
9	96	95	94	93	91	90
10	100+	100+	100+	100+	100+	100+

Table A6.11 Conversion of standardized scores to percentile ranks

SS	PR*	SS	PR*	SS	PR*
130–132	98+	109	72	91	28
128–129	97	108	70	90	26
126–127	96	107	68	89	24
125	95	106	66	88	22
123–124	94	105	63	87	20
122	93	104	60	86	18
121	92	103	58	85	16
120	91	102	55	84	14
119	90	101	52	83	13
118	89	100	50	82	12
117	87	99	48	81	11
116	86	98	45	80	9
115	84	97	42	79	8
114	82	96	40	78	7
113	80	95	37	76–77	6
112	78	94	34	75	5
111	77	93	32	73–74	4
110	74	92	30	71–72	3
			70	2	

SS = Standardized score; *PR = Percentile rank